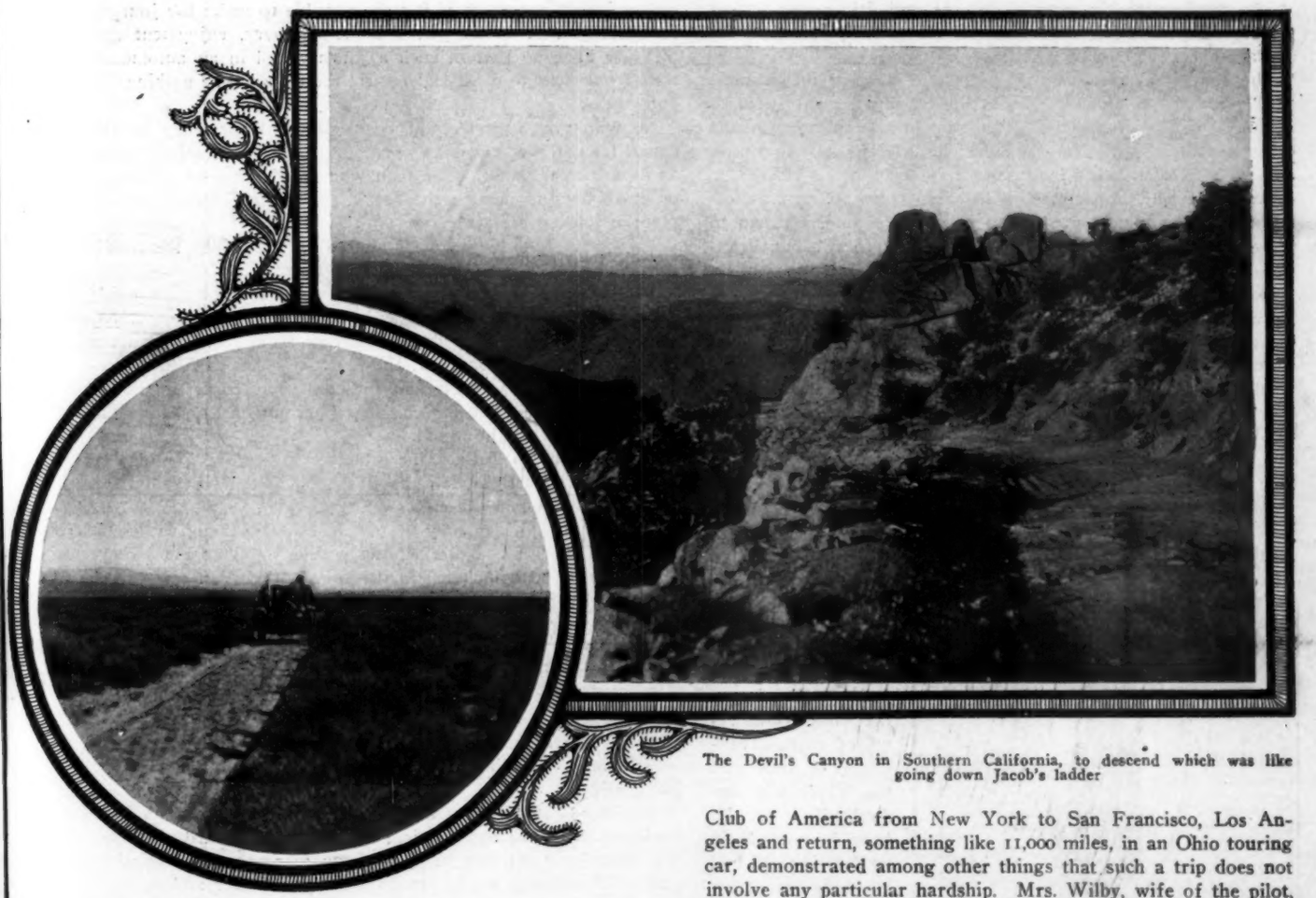
VOL. XXV NEW YORK—THURSDAY, DECEMBER 21, 1911—CHICAGO No. 25

THE AUTOMOBILE

Across the Continent and Back



The Devil's Canyon in Southern California, to descend which was like going down Jacob's ladder

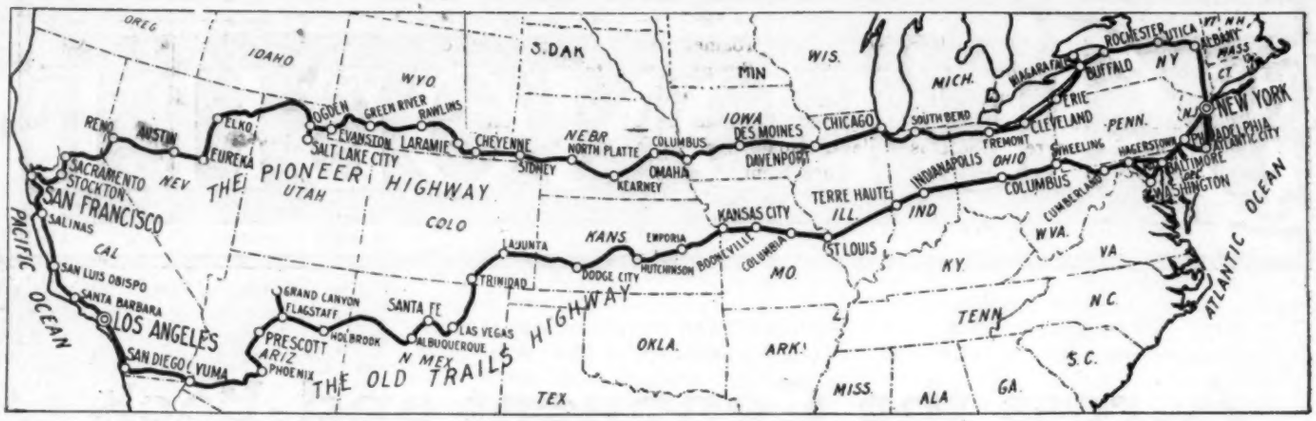
Volcanic ash road through the sage brush

AUTOMOBILE touring from coast to coast and back again will undoubtedly prove to be an important feature of motor car use. Trips from the Atlantic to the Pacific have been accomplished so frequently and with such a wide variety of cars that the general ability of all standard automobiles to negotiate the physical journey may be said to be firmly established.

The round trip is simply an extension of the one-way journey and is well within the strength and power of any good automobile.

The recent trip of Thomas W. Wilby, special agent of the Office of Public Roads, made under the auspices of the Touring Club of America from New York to San Francisco, Los Angeles and return, something like 11,000 miles, in an Ohio touring car, demonstrated among other things that such a trip does not involve any particular hardship. Mrs. Wilby, wife of the pilot, was a passenger throughout and finished the trip in perfect health. It required 105 days, or an average of about 105 miles for each day.

The car experienced no serious mechanical troubles and Mr. and Mrs. Wilby and driver, F. D. Clark, enjoyed the whole journey. Of course the trip was pioneering in a sense, as Mrs. Wilby is the first woman to accomplish the circuit. Some rough going was experienced; some discomfort was felt at the hotel accommodations in certain spots and there was more or less careful scheduling required in order to insure a plentiful supply of usable gasoline and oil. But these things were all exceptional, the general rule being simply to travel to the scheduled noon and night stops without making any special preparations and arrangements.



Map showing the route followed by the T. C. A. party in its double transcontinental trip

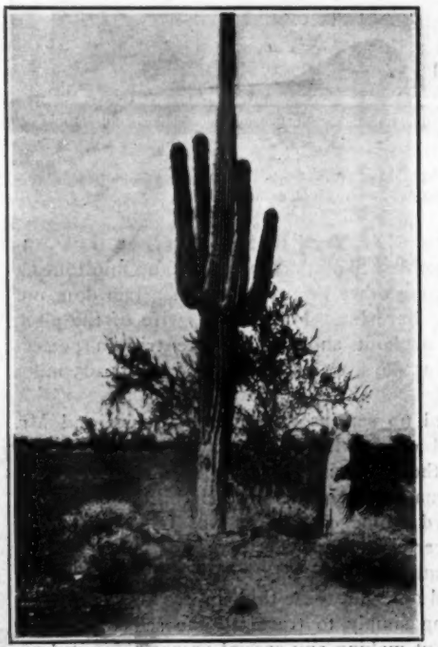
The average weekly expense for car and driver was $55 or 7 1-2 cents per wagon mile, which is considerably less than the average operative cost of automobiles.

The route traversed twenty states and touched the republic of Mexico at two points. Mr. Wilby made a special effort to include the show places of the continent in his itinerary and the route he logged will prove popular for tourists of the future who wish to take such a long trip.

The route may properly be divided into seven sections, as follows: First, from New York to Chicago; second, Chicago to Cheyenne; third, Cheyenne to San Francisco; fourth, San Francisco to Los Angeles; fifth, Los Angeles to La Junta; sixth, La Junta to St. Louis and seventh, St. Louis to New York.

Eventually such a tour can be made in 7 weeks, one for each section. At present there are two sections that require less than a week each to cover and at the present rate of road improvement two others will be passable in that period of time within a year. Another will probably be added within 2 years but the last two stretches, the big runs from Cheyenne to San Francisco and from Los Angeles to La Junta, will require longer to reach such a state of perfection.

Mr. Wilby's party was in no hurry. From one end of the route to the other a leisurely pace was maintained. The car was powerful enough to take advantage of good roads when they were met and so it did not have to be forced in the heavy spots. There was more or less social activity all along the route which required extra expenditure of time and the whole trip undoubtedly could have been made in 70 days if there had been any reason for so doing.



Giant cactus found plentifully in Arizona

However, speed on a transcontinental tour by automobile is out of place. The man who merely wants to get from New York to San Francisco in the least number of minutes possible will patronize railroads for many a year. It would please such a passenger if it were possible to make the journey in one night, or better yet, 1 hour. Scenery, enjoyment and pleasure have no part in such a journey and in an automobile tour from coast to coast and return, there should be nothing but enjoyment.

No matter how perfect the roads of the future may be, the round trip of the American continent should not include speed as its principal factor. The man who could boast of hitting 50 miles an hour in passing the Grand Canon of Colorado has no place in touring literature.

Taking the tour by stages as plotted by Mr. Wilby the conditions to be met are as follows:

The first section, extending from New York to Chicago, needs little notice. It can be done with ease in 5 running days, but should occupy at least 6 days. Starting from New York on a Monday morning in summer, the first day's run to Albany presents nothing but a pleasurable outlook. The roads are boulevarded all the way and first-class hotel accommodations for noon and night stops will be found.

From Albany to Buffalo, the route for the second day may be taken over roads that are almost as good as the foregoing. In Buffalo the hotels are first class.

The third day's run may be to Cleveland, skirting the south shore of Lake Erie. No difficulties will be found so far. There is some poor road included in the fourth day's run and it will probably be found to be advantageous to stop at Toledo for the night. From Toledo to South Bend, Ind., the road is fair to good, with a little poor going. From South Bend to Chicago is generally good.

No difficulties of any kind should be presented by this tour. Gasoline and oil of various kinds may be had every 20 miles if needed and from any point in the road a big city can be reached in an hour's traveling, where suitable accommodations can be had readily.

The second stage, from Chicago to Cheyenne, presents a wide variation from the first section, but imposes no hard obstacles. The first day's run may be to Davenport, Ia., on the Mississippi river. The Illinois roads are good in dry weather and passable in wet and there are numerous big cities between Chicago and Davenport that will afford everything necessary for the comfort of the tourists.

After crossing the Mississippi the way leads over the famous River to River road. This is a fine highway in dry weather, but all but impossible after a rain. The true significance of gumbo can be learned on the River to River road if there has been a wet spell just before starting from Davenport. Assuming that the sky is clear and there has been no heavy rain for a week, the trip to Des Moines, capital of Iowa, will be a pleasure.

Precisely the same conditions obtain for the run from Des Moines to Omaha that exist from Davenport to Des Moines. The road is better than Fifth avenue in dry weather and worse than the road from Natural Bridge to Roanoke, Va., after rain.

The Missouri River is crossed at Omaha and before the tourist stretches away the great plains where once roamed the buffalo, but which have now been converted into the granary of the nation. Up to a very recent date the roads through Nebraska have been unimproved and touring over them has been anything but a pleasure. There is little macadamizing to be found even now, but fully half of the distance from Omaha to North Platte has been graded and dragged. If the weather has been dry, or if the roads have had a chance to dry out for 24 hours before starting over them, there will be no particular trouble to be found. From this point west mileages, however, will have to be cut down sharply.

It will be well to try to go no further than Columbus on the first day out from Omaha. The roads are not bad, particularly in dry weather, although after a protracted drought there will be much dust. The next day's trip should be to Kearney and the next to North Platte. The character of the country has changed radically from what was found further east. The tourist is on the edge of the dry country. From Kearney west the dry, rolling hills are covered with sage brush where they have not fallen under the hand of the agriculturalist.

Only 30 years ago this whole country west of the Missouri river was deemed to be fit for a cattle range only. Gradually the desert limits have been pushed back and to-day heavy crops of grain are raised without irrigation clear to the Wyoming line. But here and there the tourist may still see a vast sweep of sage covered hills, extending to the horizon. The air is dry and clear, and touring, if done without too much effort at speed, will be found to be delightful.

But upon leaving North Platte it will be just as well to arrange for supplies of gasoline and oil at various intervals beyond Cheyenne. At Laramie, Rawlins, Green River and Evanston such supplies can be had, but if it is not possible to order fuel and oil to be delivered along the route at convenient intervals provision for an emergency supply to be carried in the car itself should be made. It is not a pleasant thing to think about running short of fuel, water or oil on a lonely desert or mountain trail, far from human habitation. It is much better to carry an extra supply, even though arrangements can be made to get supplies along the way.

Sidney is a town of comfortable size and should be the first night stop beyond North Platte. The run from there to Cheyenne is rather long, but the road is well marked and presents no particular difficulties.

Cheyenne is pretty well up in the Rocky Mountains and from there to the Utah state line the tourist would better make haste slowly. While the distances between considerable towns is not great, it is quite certain that the breaking of an axle 20 miles from one of them would prove serious enough. The answer is to drive slowly and carefully, avoiding irrigation ditches and using much judgment in crossing what are known as dry washes and high centers. The first step across Wyoming is from Cheyenne to Laramie. This is a stiff climb to the level of the high plateau, across which the Union Pacific tracks traverse the backbone of the continent. The road surface is not bad practically all the way to Laramie and the tourists will pass the Sherman monument, marking the highest point on the continental divide, before reaching Laramie. This is 8,010 feet above sea level. Medicine Bow, a small place with a good hotel and where necessary supplies of fuel and oil may be obtained is far enough away from Laramie to make a good mid-day stop and from there to Rawlins, 57 miles, the road tranverses a wild country where ranch houses are few and precautions as to fuel should be taken. The route is some distance from the railroad.

Beautiful natural road through Dog Valley

At Rawlins all necessities and many comforts are available. The main hotel is comfortable and there are several garages and supply depots.

There is a good road out of Rawlins as far as Wamsetter, where the trail enters the Bitter Creek country. Desolate solitude about describes the aspect of nature through this stretch of the way and it is not much improved in crossing the Red Desert, which has been described as the worst link in the continental chain of highways. This road however, is not superlatively bad. It is much more easily traveled than would be the River to River road in Iowa after a hard rain. It is rough and difficult, but in any long tour worse roads will be found in spots. Rock Springs, a small railroad town, affords about the only chance for a night stop in this territory. The accommodations are not what may be termed luxurious.

From Rock Springs to Green River the road is excellent and noon stop may be made at Green River. Granger lies a short distance beyond. This place is known as the gateway, from a railroad viewpoint, to the whole intermountain region. West from Granger the old road, used by former tourists, may be

A typical panorama encountered by the Wilbys in their journey through the Great Southwest

Lava-strewn mountains in Arizona through which the travelers progressed at a snail's pace

abandoned and striking off to the south a better road will be found that is fully 30 miles shorter to Evanston. This passes through Lyman and Bridger, prosperous farming communities, where smart efforts at road improvement have been made. The road out of Bridger is not well posted and much care should be exercised to get on the right road. Within the past few weeks this section has been posted so that mistakes in future need not be numerous. The last 20 miles into Evanston is over excellent road.

Gasoline is scarce in this country but may be had. Provisions for oil are necessary. Evanston has everything necessary in the way of supplies and accommodations, but not many luxuries.

The next day's run is short, only 86 miles to Ogden, Utah, but it is one of the most delightful trips possible to modern motoring. The way leads through a series of small fertile valleys, well watered and productive under the hands of the Mormons. The road is fine and the scenery, particularly after reaching Weber canyon and Devil's Slide, is gorgeous in the extreme.

Ogden affords practically everything the tourist could find in an eastern city, including excellent hotels. If desired, the tourist may run down to Salt Lake City and, after spending as much time as he wishes in sightseeing, can run back to Ogden to resume his westward way.

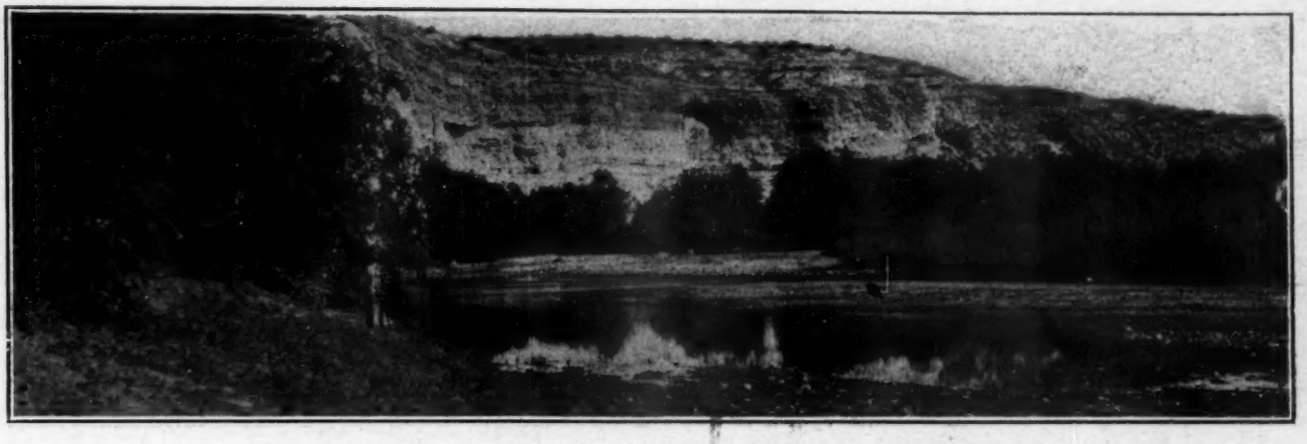
This may be a day or a week, for the Mormon capital is a fertile field for the tenderfoot tourist. Park City and its silver mines and the various wonders of the region may be inspected with pleasure and profit. Salt Lake is only 35 miles south from Ogden and the roads are fine, but rather dusty.

West from Ogden the road lies through an absolute desert. There are hundreds of miles of alkali flats that are as forbidding and austere as a New England old maid. After rounding the Great Salt Lake to Lucin, the trail strikes southwestwardly to Montello and Elko, Nevada. The roads are good all through this section and passing south through the Diamond Valley to Eureka. There is much wonderful scenery in this valley, the desert scheme of coloration appealing with much strength to eastern visitors. Turning west at Eureka the road strikes across the desert toward Reno, passing Austin and Fallon. The tourist should arrange a sliding schedule across the desert west of Ogden. Extra supplies of water should be carried in the car and a fuel and oil schedule ought to be made in advance. The towns are infrequent, but a night schedule can be arranged that will not necessitate any camping out. Eureka is 106 miles from Elko, mostly over good gravel roads. The little city has a good hotel and offers an opportunity to get fuel and oil. Eastgate should be the next night stop, 130 miles west of Eureka. A ranch house is about the best that it can offer in the way of hotel accommodations and care should be taken to secure a supply of fuel. The run into Reno is through much the same kind of territory. At Reno there will be no trouble about accommodations and supplies.

The climbing of the Sierra Nevadas to Truckee presents quite a problem for any kind of transportation. The roads are not bad, but the grades are terrific and entirely impassable after a snowstorm. Such storms, however, are not frequent except for about 6 weeks in the dead of winter, when no sane human being would want to go mountain climbing. From Truckee to Sacramento the way is sharply down-grade, winding in and out among the mountain peaks of the great coast range. On the down turn the road passes through the section where gold was first discovered in California and leads by easy stages to San Francisco via Stockton and Oakland.

An extra week ought to be put in by the tourist in examining Nevada with its marvelous mines and wonderful color plans, but a week more can be spent enjoyably in the Sierras and 2 weeks is not too long to enjoy San Francisco after the long trip.

Through the cotton fields of Southern California, where the roads were generally excellent



Montezuma's Castle is a huge cliff dwelling in the limestone bluffs north of Prescott, Arizona.

The fourth stage of the great round trip extends to Los Angeles. The Californians declare that the route is perfect, but the eastern tourist will find that it is not. Except for considerable macadamizing near San Francisco and Los Angeles the road is rough and dusty except during the rainy season and deep and muddy during the rainy season.

Los Angeles is one of the garden spots of the world and is deserving of an extended visit. It has the largest number of automobiles per capita of any large city in the world and its roads are wonderfully perfect, particularly in the territory immediately adjacent to the city.

On the eastward way the tourist must take his own time. There is something interesting in almost every mile and haste will serve to spoil many a memory that otherwise would prove a pleasant possession. And there is another excellent reason for moving deliberately, for the roads are very rough and heavy in long stretches.

It is just a nice easy run from Los Angeles to San Diego and the roads are good all the way. Then the course turns east and passes Campo, the Devil's canon, Imperial and El Centro. The roads are very narrow and winding and the scenery is sublime. After El Centro the way leads out upon the floor of the desert. Following this there is a space of 60 miles of exceedingly rough going, the trail crossing the international line into Mexico and returning at Aldrado. From there to Yuma, Ariz., the road is a severe trial. After leaving Yuma the first big obstacle to be passed is the ford of the Gila river. For a considerable period of each year this stream is too shallow to ferry and too deep to ford. Provision for a team of mules to pull one's car through this stream should be made. From the east bank of the river into Buckeye the road is indescribably rough and 10 miles an hour is a perilous rate of speed. But from there to Phoenix the roads are fair to good. A side trip to the Grand Canon should be made from Flagstaff before taking up the tour again. The roads from Phoenix to Prescott are fair to excellent and from Prescott to Flagstaff poor to fair.

Arizona presents a virgin field for the tourist. There is something wonderful to be seen every hour in the day, the enchanted, petrified forests and real forests; the fields of green grain and the spectacular cactus, combined with the sweep of the desert and the grim strength and ruggedness of the mountains.

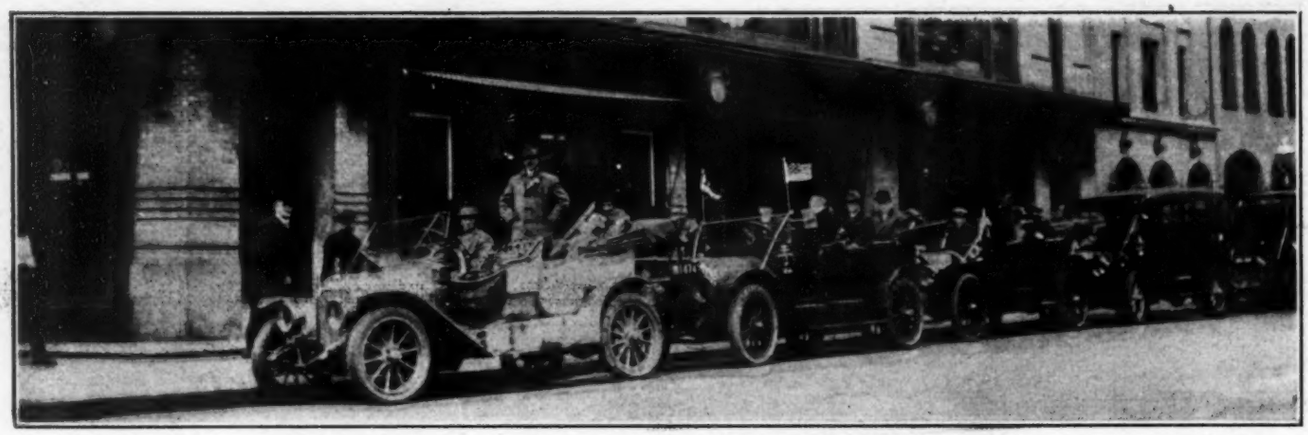
The route passes through Holbrook and continues to the New Mexican line without radical change in topographical characteristics. Albuquerque, the ancient capital, is the first New Mexican city of size to be encountered. Then come Santa Fe and Las Vegas in the Raton Mountains. The Raton (pronounced Ratoon) Pass, across the summit of the Rocky Mountains, is the last bit of major mountain-climbing on the route. The country is practically flat at Trinidad, Colo., and thence out on the dry plains to La Junta (pronounced La Hoonta), where the fifth stage of the journey ends.

From La Junta to St. Louis is a very easy run compared with what has gone before. There are no hills to climb of any great size and the Kansas roads are fair to good generally. If it is wet, however, the going will not be enjoyed and if it is very dry there will be much dust. In Missouri the roads are deep in spots and rough in others, but much road improvement is being made in that state.

The chief cities touched by the return route are: Dodge City, Hutchinson (the salt center), Emporia, Kansas City, Booneville, Columbia and St. Louis. East from St. Louis the way leads through Illinois to Terre Haute, Ind., Indianapolis, Columbus, O., Wheeling, West Va., Cumberland, Md., Hagerstown, Washington, Baltimore, Philadelphia, New York.

The direct route, without side trips of any kind, measures about 8,500 miles. The side trips have a mileage of 1,500. Mr.

Donner Lake, California, a beautiful spot where many tragedies were enacted in the pioneer days



Arrival of the Wilbys in the OhiO Mudhen with their escort at the headquarters of the Touring Club of America

Wilby's party covered 1,000 miles more than this, but it is a matter of individual taste as to whether this additional mileage should be included.

The late summer is an ideal time to start such a tour and the northerly route followed on the way west will do much to temper summer heat. Then, by the time the party has reached Los Angeles, the season will be so far advanced that the southern route returning will prove more agreeable than the one through the northern mountain passes.

Mr. Wilby states that no special equipment is necessary for this long tour, but in his notes he calls attention to the fact that the car was furnished with a heavy tarpaulin or oil-cloth cover for use in heavy rain or hail.

There is no necessity of carrying a camping outfit unless the taste of the party is in that direction, for some sort of accommodations can be found at each night stop. Once in Nevada and twice in the southern desert the party had to sleep in ranch houses and the hotels could not be termed luxurious outside of California west of the Missouri river. Here and there is to be found an excellent hostelry in the intermountain region, but the general run is not like the eastern or California hotel.

Good, warm clothing and complete waterproofs are essential to health and comfort on such a trip, but care should be taken not to clutter up the car with a lot of unnecessary baggage. Every extra pound counts on a short tour and on one including 10,000 miles one extra suit case weighing 50 pounds may mean the difference between comfort and misery from one end of the ride to the other. Only such baggage should be carried as may be packed securely in a canvas cover and strapped behind the car. A hand bag in the tonneau is an abomination. It either crowds the back seat or hampers the foot room. On a short trip such an inconvenience is trifling, but on one that is long it is about as trying as could be.

Another bad effect of extra and unnecessary baggage is its destructive tendency as far as tires are concerned. At normal load and inflation tires are made to deliver a minimum mileage by their manufacturers. If 50 pounds is carried over the normal load the tires are surely going to suffer.

Arrangement can be made before starting to have laundry work done at various points en route. If an emergency camping outfit is carried it should contain absolutely nothing that can be left behind. A portable alcohol lamp, a silk dog-tent and a single pot and pan. The robes of the car can be used as bedding in a pinch. Emergency rations, ready packed, will furnish enough food to keep soul and body together until some haven of refuge can be reached. The whole outfit should not weigh over 25 pounds.

Gasoline can be had all along the route at convenient intervals, but in some sections it is much scarcer than in others. In price it ranges from 11 1-2 cents to 50 cents a gallon. The latter price obtains where there is the least supply. On this trip the point where gasoline is highest is between the large towns of Arizona and to a degree in Wyoming and Nevada. At Omaha the tourists will do well to buy three cans for emergency use. One should carry gasoline, another oil and the third water. They may not be used at all, but in case of need they will prove to be wonderfully welcome. It is possible to strap these cans on the running boards and in the tonneau, so that they will not crowd the passengers.

Within the next year or two many automobile parties will make this trip, and as each successive car passes over the route it will be found that road conditions will show improvement. The whole country is alive to the need of good roads and the mere plotting of such a double transcontinental tour will undoubtedly lead to considerable immediate interest in this route. It should be understood that the mountain passes in Wyoming and at Truckee are impassable for automobiles in winter and that the Yuma desert, Arizona and New Mexico are not pleasant touring grounds in July and August. And, on the other hand, the trip across the plains is not pleasant in wet weather and early spring touring is not pure joy in the east. Therefore such a trip as Mr. Wilby made should be undertaken systematically and with due care to avoid the unpleasant features noted above. May would be a fine time to start, but August would be better, particularly if the tour is to be leisurely, as it should be to properly enjoy the beauty of the scenery along the route.

Maryland Motorists Must Go for Tags

BALTIMORE, MD., Dec. 18—Judge Gorter, in an opinion which he handed down in the Superior Court, held that the State Motor Vehicle Law does not require the Commissioner of Motor Vehicles to deliver license tags to the homes of owners of cars. The question raised was whether the law required the Commissioner of Motor Vehicles to deliver the metal plates or markers which the law required to be attached to motor cars to the owners' homes, the complainant in the case being William B. Littleton, of Hagerstown, Md.

Road Experts Meet in New Hampshire

CONCORD, N. H., Dec. 18—The first good roads convention ever held in New Hampshire—and the second ever held in New England, the first being at Boston three years ago—ended its deliberations to-day after being in session two days, during which time about 300 men prominent in highway maintenance work had a chance to exchange ideas on the subject.

Governor Robert P. Bass was instrumental in bringing the convention here and he had Federal and New England officials as guests to give an outline of what New Hampshire needed.

Industrial News by Mail and Wire

DAYTON, O., Dec. 18—The first annual Speedwell truck convention, just held at the factory, was a success from every standpoint. The agents received much valuable information from Mr. R. Harry Croniger, who has charge of the truck end of the Speedwell business. The burden of his instructions was: First, in showing truck prospects how methods of handling goods may be re-adjusted, and second, demonstrating the economy of the truck and then giving a conservative and liberal estimate of the probable operating costs and if trucks are installed to co-operate in educating drivers and mechanics to give the trucks the sort of attention and consideration which will produce greatest efficiency.

Those of the agency force present were: B. A. Jackson, New Orleans; Frank A. Groves, Chicago; H. D. Hudson, Minneapolis; P. D. Karshner, Kansas City; L. V. Lynch, San Francisco; George L. Baker, Dayton; Paul C. Curtis, Boston; G. B. Garrison, Chicago; A. J. Sanderson, Buffalo; C. A. Nation, Portland, Ore.; John Cunningham, Rochester; W. L. Hicks, Nashville; N. J. Adams, Troy, N. Y.; Eugene Hanking, Jacksonville, Fla.; E. A. Shanks, Louisville; George Turner, Pensacola, Fla.; J. B. Hastings, Montgomery, Ala.; W. P. Peterman, Franklin, La.; J. A. Kays, Meridian, Miss.; Mitchell Nash, Waco, Tex.; Will Spring, Houston, Tex.; Walter C. Martin, New York; H. H. Hawkins, Los Angeles; E. B. Jenkins, Pittsburgh, and Lloyd Richards, Mobile, Ala.

To Double Output of Grinnell Electrics

DETROIT, Dec. 16—At a meeting of the Grinnell Electric Automobile Co. to-day the directors decided to double the output for the coming year, enter the wholesale field and begin an extensive advertising campaign. Henry Goodman, of New York, was present, and a contract was closed with him to represent the company in the East.

About three weeks ago the company, which formerly was the Phipps-Grinnell Electric Auto Co., was reorganized, C. A. Grinnell and I. W. Grinnell, of the firm of Grinnell Brothers, the largest piano house in Michigan, purchasing the stock of Joel G. Phipps, giving them a majority of the holdings.

New Company to Handle Imported Cars

Three veterans of the automobile business have formed a new company, with headquarters in New York, to handle several makes of imported cars. These are Paul Lacroix, Harry U. Kibbe and Stefan G. Kjeldsen, and they are organized under the firm name of the Paul Lacroix Automobile Co.

The new company has the exclusive agency in this country for the English Daimler, Clement-Bayard, Itala and Zedel, and will also sell Renault and Panhard cars. The Zedel, which is new to America, is a small car. The new company will exhibit at the Importers' Automobile Salon, showing its different makes with bodies by Demarest.

Ford Co. Cuts Giant Melon

DETROIT, MICH., Dec. 18—While the motor car concerns are not disposed to tip off their plans in advance, it is said that several of them have arranged to remember their employees in one way or another, while there are rumors of a number of large-sized dividend distributions. The Ford Motor Co., it is learned on good authority, recently distributed $1,000,000 among its stockholders, Henry Ford receiving a little less than 60 per cent., and no doubt some handsome bonuses will be forthcoming if the sales department makes good on its estimate of 75,000 cars for the 1912 season.

Motorette May Be Reorganized

HARTFORD, CONN., Dec. 18—Although no official announcement to the effect has been made, it is understood on excellent authority that an effort will be made to reorganize the C. W. Kelsey Manufacturing Company, of this city, manufacturers of the Motorette and that the new company will continue to make the three-wheel motorcars.

The Motorette Company was formed last fall to manufacture a three-wheeler at Hartford, C. W. Kelsey, formerly of the Maxwell-Briscoe Company, being at its head. It was backed with Philadelphia capital. It has been in difficulties several times during the past year and its present trouble is the cumulative result of a number of similar crises. Formal action was commenced at Hartford on December 6.

Universal Truck Co. Reported Sold

DETROIT, MICH., Dec. 19—The Universal Motor Truck Co. has been sold to Howard W. Walton, of New York, according to announcement this afternoon. The corporation is capitalized at $350,000. Among those who are reported to have sold their holdings to Mr. Walton are the following: C. H. Haberkorn, C. B. Culbertson, August Kling, A. E. Barker, George Uhlein and Louis Camper.

U. S. Motors Netted $2,040,256

Stockholders of the United States Motor Co. held their annual meeting Tuesday and elected J. W. Stoddard to succeed H. J. Edwards on the board of directors. The annual report of the company showed a net profit up to the end of the fiscal year of $2,040,256 and after dividends, interest and depreciation had been deducted it left a net surplus of $453,748.

There has been a marked advance in United States Motor stock on the Detroit exchange the past few days. Common has jumped from 13 to 20 and preferred from 55 to 62, with the upward tendency apparently unchecked.

Lozier to Put Out Big Truck

DETROIT, MICH., Dec. 18—It is reported that the Lozier Motor Co. is preparing to put a high-power truck on the market in the near future, and may have it ready for exhibition at the Detroit show along with several other cars. The company's engineering department has given the truck question a good deal of careful study and several new ideas will be incorporated in the forthcoming truck, it is understood.

Hupp Announces New Touring Car

DETROIT, MIH., Dec. 18—R. C. Hupp has announced four self-starter models of the new R-C-H car, including a five-passenger touring car, a two-passenger roadster, a touring roadster and a Colonial coupé. All are equipped with dual ignition, demountable and quick detachable rims, 32 x 3 1-2 inch tires, Prestolite tank, extra rim, top, side curtains and all the rest. Mr. Hupp plans to display his full line at the Detroit show.

The Legal Field—Spark Plug Suits

SPARK PLUGS next will be the focus of interest in the automobile world. The whole matter of their legal status is about to be threshed out before the United States court in New York when the legality of the Mosler patent is put to the affirmative test, probably at the February term.

A. R. Mosler & Company have commenced actions against the Auto Supply Company, John Lurie, president, involving alleged infringement of the patent owned by the Mosler company on the part of the Metzger, Rogers, Belgian, Rajah and American Coil Company spark plugs. Suit has also been brought against the Emil Grossman Company, the Champion Spark Plug Company and the Jeffrey & DeWitt Company in the Federal courts at and near Detroit and a similar action has been entered against the Motor Car Equipment Company.

The suits are all similar and the complaint alleges infringement of the Canfield patent No. 612,701, now owned by the Mosler company, covering the two claims following: "In a gas, oil or vapor engine igniter or sparker a recess or counterbore around the electrode or electrodes, above the sparking point or points when said electrodes are used vertically, for the purpose of preventing an injurious accumulation of the products of combustion or other foul matter on the insulation of said electrodes."

The second claim is for a recess or counterbore of such depth and size as to form space for an air cushion and prevent the circulation of the explosive mixture into such counterbore.

The *prima facie* proof has been made and practically all the testimony in the most advanced cases has been taken before the commissioner, and Judge William A. Redding for the Mosler company, believes the cases will be ready for adjudication before the end of the year. Under fair circumstances a final decree of the court of last resort can be had within the next year.

The history of the patent has a tinge of romance connected with it. It was issued to Frank W. Canfield, of Manistee, Mich. (now dead), October 18, 1898, and consequently has nearly 4 years to run. On the recommendation of Mr. Redding it was purchased for a substantial sum by the patent association affiliated with the A. L. A. M. During several years it lay dormant in the treasury of the association while the attention of the automobile world was centered on the Selden litigation. But about 2 1-2 years ago, Mr. Redding advised the Mosler company to purchase the patent and that action was taken. Under the terms of purchase the right was given to each member of the A. L. A. M. at that time to manufacture plugs under this patent for its own product, without royalty. The Mosler company issued a license or two to other manufacturers and the present suits are the result of its efforts to assert its exclusive rights to the device covered by the Canfield patent. The complaint asks for injunction, accounting and damages, amounting in the aggregate to about $1,000,000. The deposition of Prof. Carpenter, of Cornell University will be taken in support of the Mosler claim.

New Patent Laws May Affect Industry

WASHINGTON, D. C., Dec. 16—Never before in the history of patent legislation have bills and proposed legislation been introduced in Congress of more vital importance than during the present session. The newly introduced bills, numbering nineteen in all, cover patent matters of deep interest to the motor car industry. One of the patent bills now pending proposes compulsory license. Under its terms the owner of a patent is put in a peculiar situation. If another inventor wishes to use it for an improvement on an invention he has only to apply to the Commissioner of Patents and get a right to use the patent upon terms without any notice or hearing. Another drastic bill provides that a patent granted upon an improvement on a machine, etc., previously patented shall expire at the same time as the original patent. The other bills are equally drastic.

It is known that influences are at work in Congress to secure, if possible, a radical change in the patent laws, and the introduction of these bills is the first step in that direction. According to noted patent attorneys these bills, if passed, will effect such a complete revolution in the American patent laws that various industries will be stunned by the differences in their legal rights under the existing and under the proposed laws.

Klaxon Fails to Restrain Newtone

United States Judge Thomas I. Chatfield has denied the motion of the Lovell-McConnell Mfg. Company, makers of the Klaxon horn, for a preliminary injunction against the Automobile Supply Mfg. Company, makers of the Newtone horn, and has decreed that all questions of alleged infringement and other defenses shall be reserved for final hearing. The court also prohibits both litigants from making or circulating statements likely to hamper the court in coming to a prompt decision.

The Newtone party is specifically prohibited from circulating the literature known as The Truth and The Facts in the Case, and the complainants are barred from bringing actions apparently based only on the hope of intimidating customers of the defendants.

The case will probably be heard in April, 1912.

The decision is as follows:

"This cause coming on to be heard on Sept. 25, 26 and 27, upon complainant's motion for preliminary injunction under the patents number 923,048, 923,049, 923,122, granted to Miller, Reese, Hutchison, on May 25, 1909: On complainants' motion to enjoin the publication by defendants of a certain circular entitled (The Truth), or (The Facts in The Case); and further on defendant's motion to prevent further prosecution of a number of pending actions and the bringing of any additional actions against defendant's dealers and any intimidation of defendant customers and the trade generally; and on reading and considering on behalf of the complainants twenty-four affidavits, with exhibits therein identified, and after hearing George C. Dean, and T. J. Johnston, of counsel for complainants and C. A. L. Massie, and Ralph L. Scott, of counsel for the defendants, both orally and by briefs, and the court being fully advised in the premises. and having under date of Nov. 20, 1911, handed down a written opinion—now, on motion of C. A. L. Massie., solicitor and of counsel for defendants, it is this day ordered that complainant's motion for preliminary injunction under the three patents aforesaid, be and the same is hereby denied and all questions as to alleged infringement and other defenses are reserved for final hearing.

"And it is further ordered, that in order to prevent a recurrence similar to those relating to the matters of advertising and threatened suits, the complainants and the defendants be and they hereby are enjoined from any act or proceeding which will embarrass or prevent this court in bringing this suit to a prompt and complete determination upon the merits. That any suit brought by complainants under the patents aforesaid, based upon the existence or use or sale of defendant's said Newtone horns, and in which the issue shall be dependent upon the same conclusion as the issues herein, shall not be carried beyond the point of serving process. And that this injunction includes such institution or prosecution or litigation in other districts as will ap-

parently be for the purpose of intimidation or punitive effect alone. And it is further ordered that the defendants and their agents and attorneys be and they hereby are enjoined from circulating, in the same or similar form, the contents of the circular known as (The Truth) or (The Facts in The Case), set forth in complainant's papers, and both parties, their agents and attorneys are enjoined from attempting to present to the public and to their customers their views as to the meaning and effect of the evidence already presented, or as to what it may have shown in the present action (but counsel may explain the same to persons entitled to the information), in order that, whichever party shall ultimately prevail, the trial of this action will not be affected thereby in matters to which the decree of the court cannot effectively reach.

"And that in view of the previous disputes arising herein, the defendants be and hereby are enjoined from making to the public or the trade or to any jobber, dealer, or purchaser of warning signals, either verbally or in writing, in the same or similar form, any statement such as made in the exhibit letter regarding preliminary injunction, the patents in suit, the question of infringement or complainant's course with regard to the same. And that the complainants be and are hereby enjoined from making or circulating any of the statements heretofore restrained by this court. (Signed) THOMAS I. CHATFIELD,
United States Judge."

A.L.A.M. Patents to Undergo Court Test

Proceedings in the suit against the Palmer & Singer Mfg. Co. were brought to public notice during the past week by the sending of more notices on behalf of the plaintiff in the case, warning of alleged infringement of the Dyer patents.

The suit is in the United States District Court, Southern District of New York, and has been pending for some time. The Dyer patents include one covering an H-slot guide plate for the controlling lever; a gearing for automobiles; a slide gear; unit power plant and a planetary gear device.

The A. L. A. M. was interested in the patents and was empowered under its rights to give shop licenses to any of its members. The Palmer & Singer Co., while a licensee of the A. L. A. M., never applied for such shop license, according to officials of that organization.

Dyer is proceeding to stop the alleged infringement of his patents and to collect damages for such infringement. The case may be reached during the coming term of court.

Electric Storage Battery Company Wins

Denying a motion for a rehearing, the United States Circuit Court of Appeals has settled finally the preliminary stage of the battle that has been waged for several years by the Gould Storage Battery Company and the Electric Storage Battery Company, in which the former sought to force the latter to convey to it the Madden patent owned by the Electric Storage Battery Company. The court below decided against the Gould company and the upper court sustained the decision.

The present status of the litigation is that the Gould company is suing the Electric company in the New Jersey federal court and the Electric company is suing the Gould company in the western district of New York. Both suits allege infringements.

The Madden patents are two in number. The first of these, 570,244, was granted October 27, 1896, covering a machine for transforming, reducing and preparing lead blanks for storage battery requirements and to produce grids of various sizes and kinds. The second patent is No. 572,363, for a machine to make grids with shelves or partitions which have uniform molecular density. This patent was issued December 1, 1896. The first is owned by the Electric company and the second by the Gould company.

The court in deciding the matter at issue concludes with the following paragraph: "This unfortunate controversy could have been avoided had the inventor been less disingenuous and had the parties observed with greater care some of the principles of the Decalogue. Neither party is blameless, but we are unable to say that the proof preponderates so strongly in favor of the complainant as to justify us in granting the extraordinary relief demanded. The decree is affirmed with costs."

Auto Lighter Sues on Patents

Suits have been filed in the United States Circuit Court by the Auto Lighter & Equipment Co. of Massachusetts against the Inst Lighter Co. of Ohio and the Oldsmobile Co. of Massachusetts for alleged infringement of United States letters patents 953,985 and 962,113.

The Motor Specialties Co. of Boston, manufacturers of the Flash auto lighter and licensee under these patents, also appears as complainant in the above suits.

It is claimed that these patents broadly cover a safe and positive system of automatic acetylene gas ignition, particularly in the fact that the igniting spark precedes the gas at the headlights.

Another feature claimed under these patents is a single operating handle for controlling both the gas and the electric spark to light or extinguish the lights with one movement, which handle locks in on or off positions.

Weed Chain Gets Six More Injunctions

The past week has been lively for the Weed Chain Co. in the courts. Preliminary injunctions have been granted on behalf of the company against three concerns within the jurisdiction of the United States courts in the eastern division of northern Ohio as follows: The Studebaker Automobile Co., M. and M. Co., and Dorsey D. Foote. This action is similar to numerous others taken by the Weed concern to enforce its patent rights.

In the United States Circuit Court in New York orders were signed to extend the time for taking testimony in the actions of the Weed company against Edmond, Wooster and Newhall. These suits are like the others in general scope.

Word comes from Detroit that on Tuesday last, Judge Angell, on complaint of the Weed company, authorized a preliminary injunction against the Perry Chain Grip Company, the Union Steel Screen Company and The Motor Specialty Company, restraining them from placing the "Weeder" auto chain grip on the market. The action is based on an alleged infringement of the Parsons patent by the manufacturers of the "Weeder" chain. This the defendants admitted, but counsel declared the patent would be proved invalid on facts not presented in the Snyder case. An injunction was also sought to enjoin the Perry grip, but the court declared this would have to be taken up later.

Victor Creditors to Get Xmas Present

As a kind of Christmas present to the creditors of the Victor Auto Supply Manufacturing Co. an initial dividend amounting to 2 per cent. of the approved claims has been declared by the United States District Court officials in bankruptcy.

The dividend will be payable December 28. The dates of subsequent payments in this estate and their amount will be determined later.

Zust Debts May Be Compounded

Walter E. Coe has been named receiver for the Zust Sales Co., of New York, the concern handling the product of the Zust factory in this section. An effort is being made to effect a composition of the matter and the prospects for such an outcome are said to be excellent.

The assets and liabilities are unofficially declared to be about $35,000 each.

Rules for the French Grand Prix

IN the following translation of the official regulations relating to the Grand Prix and Coupe de l'Auto races to be held in June, 1912, under the auspices of the Automobile Club de France, the French wording has been followed as literally as practicable and without close adherence to the terminology currently adopted in this country, the object being to render faithfully, for the information of all American manufacturers, drivers and general readers, not only the general trend of the regulations but also particularly those provisions which seem to open loopholes for unexpected interpretations or which contain mandatory injunctions of an unusual nature.

Official Regulations for the Grand Prix of the Automobile Club de France, June, 1912, and for the Coupe de l'Auto

1—The Automobile Club de France organizes for 1912 an international race reserved for constructors defined under section 4 and entitled the Grand Prix de l'Automobile Club de France.

2—In this trial shall be incorporated the "Coupe de L'Auto" for the vehicles conforming to the formula for the "Course de Voitures Légères, 1911," as given in section 13. These vehicles shall at the same time participate in the general classification.

3—A prize of 20,000 francs shall be awarded to the constructor of the vehicle arriving first under the general classification. A prize of 10,000 francs shall be awarded to the constructor who has the team securing the best position with a minimum of three vehicles finishing.

4—As constructor is considered one who has manufactured both the motor and the transmission.

5—The race will take place during the second half of June and will comprise two consecutive days at the rate of 800 to 1000 kilometers per day. The date and place will be decided later.

6—*Entries:* Each constructor has the right to enter 4 vehicles with the option of taking part at once in both trials, it being understood, however, that the total cannot exceed four.

7—Constructors employing motors or mechanisms built under the same license, or under a title into which the same name enters, cannot together engage more than four vehicles.

This rule applies without regard to nationality and whether the license is granted by a foreign constructor or vice versa.

In case of disagreement among firms manufacturing vehicles under the same license, the Sport Commission will decide the number of vehicles to which each firm shall be entitled, basing its decision on the importance of each firm as evidenced by the number of vehicles it has delivered to the public during the past three years; and, whatever the number of constructors involved, no exception will be made from the second paragraph of this section.

8—Entrance fees are: Fifteen hundred francs for one vehicle, 2,750 francs for two, 3,750 francs for three, and 4,500 francs for four. The nominations must be submitted at the office of the Sport Commission of the Automobile Club de France at No. 8 Place de la Concorde, and the list will be closed on December 30, 1911, at 6 o'clock evening. The entries will not be definitely accepted unless at that time the number of vehicles nominated reaches a minimum of thirty. If this quorum were reached December 30, entries at double fees could be validly submitted to the Sport Committee until March 1, 1912, at 6 o'clock evening.

9—The entrance fees cannot in any case be refunded and will remain as acquired for the race fund, excepting the case provided for in the third clause of the preceding section.

10—Entries will be recognized as valid only if accompanied by the fees as provided in section 8 and contingently upon acceptation by the Sport Committee.

11—If the number of entries should be judged too great, for reasons of safety, the Sport Committee reserves the right to reduce it, by selection, drawing lots, eliminatory trial or any other means at its option.

12—General Conditions: The Grand Prix is open to all vehicles without other limitations than those resulting from the provisos of section 18.

13—The vehicles taking part in the "Coupe de L'Auto" must satisfy the following conditions:

(1) Must be equipped with a motor of at least four cylinders, whose total cylinder volume does not exceed three litres, and in which the ratio of stroke to bore cannot be higher than two or smaller than one. The constructor must thus keep within these limits, no tolerance being allowed.

(2) Must weight at least 800 kilograms. This minimum weight is to be understood as follows: The weight of the vehicle with two-seated body, without water, oil, gasoline (essence), tools, spare parts. (Emptying of the crankcase and gear cases will not be required.)

14—The Sport Committee reserves the right, at the beginning of the race, to take all necessary measures for the verification of the sealing of pieces done by it.

15—All attempt at fraud on the part of a contestant will involve the exclusion from the race of the vehicle, and may, according to the circumstances, involve the disqualification of the driver, his mechanic, of the constructor interested and of other vehicles entered by the latter.

The constructor will have to pay a fine of 10,000 francs, and the Sport Committee will decide the duration of the disqualifications incurred.

16—All vehicles will carry, obligatorily and as a maximum, two occupants side by side, of a mean minimum weight of 60 kilograms for each, it being understood that where this mean weight is not reached the surplus must be supplemented by ballast.

17—The contestants will not be permitted to take part, unless on the day of weighing-in they are provided with the document issued by the Ingenieur des Mines, attesting that the vehicles entered by them satisfy the legal requirements.

18—All vehicles entered must have:

(1) A reverse gear actuated by the motor.

(2) An exhaust pointing horizontally rearward and sufficiently high to avoid stirring up dust.

(3) No vehicle broader than 1.75 meter can take part in the race.

19—The vehicles taking part in the race must, according to the nationality which they represent, be painted in the following colors:

Germany, white; America, white and blue; England, green; Belgium, yellow; Spain, yellow and red; France, blue; Italy, red; Switzerland, red and white.

20—*Weighing-in.*—A regulation concerning especially the operations of weighing-in will be published later. Its provisions will be made known betimes to those interested.

21—*Repairs and replenishments.*—Repairs and in general every other operation must be made exclusively by the crew of the vehicle.

Use of the removable or dismountable rim and of the dismountable wheel is permitted.

Replenishments—oil, fuel, pneumatic tires and spare parts—can be taken on board only at one or two places of the course, designated in advance, and every infraction of this rule will involve the exclusion of the vehicle from the race.

The exclusion from the race will also be applied to every vehicle departing voluntarily from the course.

Each firm will have the right to a section, drawn by lot, at the replenishment station or stations.

22—Firms which are not competing, but, nevertheless, interested in the race and desirous of occupying a section at the replenishment stations must pay a fee of 1,000 francs.

Requests for these sections must be accompanied by the fee mentioned and will be received by the Sport Committee of the Automobile Club de France until December 30, 1911, 6 o'clock evening. Such requests at double fee will be received until March 1, 1912, 6 o'clock evening.

23—*Drivers.*—The drivers and mechanics of each vehicle may be changed during the race, but only at the end of each lap and under the surveillance of a commissary.

The reserve drivers must be designated before the race to the Sport Committee.

The mechanic may replace the driver at any spot of the course, but only in case of duress (fatigue, accident, etc.).

24—The Sport Committee reserves the right to exclude any driver for reasons bearing upon the security of the public or of other contestants.

As soon as the constructors shall have engaged drivers for their vehicles it shall be their duty to make them known to the Sport Committee by registered letter, accompanied with an agreement of the following form:

Between the undersigned, Mr. X, constructor of automobiles, and Mr. Y it has been agreed as follows:

Mr. Y agrees to drive in the Grand Prix of the Automobile Club de France in 1912 a vehicle of the make X.

Mr. X, constructor of automobiles, binds himself to furnish, for this race, to Mr. Y a vehicle of the make X.

Signed X and Y.

By this arrangement, the driver will not be able to drive a vehicle of another make, unless the two parties agree to rescind their contract, and, in that case, the Sport Committee must be kept advised of the change.

25—The driver and mechanic of each vehicle entered must possess certificates of competence to drive automobiles.

26—*Starts.*—The order of starting in the race shall be decided by drawing lots.

The hour for starting the first vehicle on the first day and the intervals between starts will be determined later.

On the second day, the vehicles shall start in the order of their arrival and with intervals to be decided upon later.

The time for closing the race (on the first and second days) will be decided by prefectorial decree.

Under all circumstances the commissaries of the race shall have the right to stop the vehicles before the hour fixed.

27—*Parking.*—Every vehicle having finished the course of the first day within the prescribed time limits will be placed immediately thereafter under the orders of a commissary charged with watching it and conducting it in the park.

After the motor is stopped, the driver is permitted only to close the fuel and oil valves, if need be, and the vehicle will be parked by hand power.

Each vehicle will be placed in a separate compartment and nobody will be permitted to approach it before the hour for starting on the following day.

On the morning of the second day, the vehicles will be placed in the hands of their respective crews at the moment of departure for each of them.

No operation bearing upon the start of the motor, on replenishment of supplies, on repairs, etc., can take place till after the signal for starting shall have been given, and the time used for this purpose shall be counted as running time.

28—*Protests.*—Every protest must be made in writing and placed in the hands of one of the commissaries of the race during the hour following the closing of the control stations.

Every protest, in order to receive consideration, must be accompanied by the sum of 100 francs, which will not be refunded to the claimant unless his protest is recognized as well founded.

29—The contestants agree, in case of dispute, to recognize only the jurisdiction of the Sport Committee and in no case to have recourse to the courts.

30—*Responsibilities.*—Civil and criminal responsibilities of all sorts are borne by the contestants to whom they relate.

31—*Insurance.*—It shall be the duty of all constructors engaged in the race to provide for insurance against accidents of all sorts to third parties, which may be caused during the race, and also against fire, covering direct damages as well as all recourse action relating to merchandise, fuel and material deposited at their replenishment section.

To this end, it shall be the duty of constructors to mail to the Sport Committee by registered letter and one month in advance of the date of the contest, duplicate of the policies which they have signed.

On the day of the race the Sport Committee would refuse to start any contestant having failed to comply with this requirement.

32—*Application of the Rules.*—By the fact of his entry, the contestant agrees to conform to the provisions of these regulations and the decisions of the Sport Committee.

33—All points not provided for in the present regulations will be decided according to the general racing regulations of the Automobile Club de France.

34—The Sport Committee of the Automobile Club de France remains sovereign judge of the application of the present regulations and reserves the right to modify them as event may dictate.

Boycott for 1912 French Grand Prix

Immediately after the official publication of the regulations which the Sport Committee of the Automobile Club de France had adopted for the Grand Prix and Coupe de l'Auto races in June, 1912, a despatch from Vienna announced to the astonished leaders of the once powerful club that their kind invitation to the automobile industries of other countries, once more to come and cross arms with the industry of France on French soil, had not met with the glad and eager response which was accorded to similar invitations in former years, before the foremost French houses concluded to stand pat on their dignity and refrain from racing. The despatch stated briefly that a number of German manufacturers had signed an agreement to boycott the French Grand Prix race.

Inquiries made by wire in Berlin brought only confirmation of the news. The Benz, Mercedes, Adler, N. A. G., Opel, Protos, Dürkopp and Bergmann firms had all signed a contract binding each and all to permit none of the cars of these makes to take any part in the French Grand Prix race of 1912, and in the nature of things the boycott included the Coupe de l'Auto race to be run in conjunction with the Grand Prix under a separate classification. Moreover, the Belgian firm La Metallurgique, it was found, had made common cause with the Germans.

The Fiat concern of Italy, on the other hand, had refused to sign any pact, either to participate or not to participate, but at the last account had sent no entries to the Sport Committee in Paris.

Protest Against Fairmount Race

PHILADELPHIA, Dec. 14—Emphatically protesting against the granting of further authority to hold the annual Fairmount Park road race and questioning the jurisdiction of the Fairmount Park Commissioners to furnish a permit, Dr. J. William White, a member, reintroduced a lengthy resolution to abolish the event.

That the event was dangerous to the lives of both participants and spectators; was but a scheme of manufacturers, serving no good end, in that racing had no value in the development and improvement of motor cars; that the example set by racing drivers tearing off 90 miles an hour was likely to have a detrimental effect on weak, ill-balanced persons by creating a desire to emulate the speed kings; that only remarkably good fortune had so far prevented tragedies in the Park and that the chief element of interest in it is the always-present chance of accident—these are but a few of the many objections enumerated.

Admitting his personal enjoyment of these races, Dr. White said that his pleasure was marred because "by reason partly of my vote in this commission, an uncertain number of persons (among them women and children), who were by our act encouraged to be present, might be instantly killed during one of these races, and because no conceivable precaution could eliminate this possibility.

"The fact that in our races the altogether admirable management, the fine work of the police and of the Park Guards, and the amenability of the spectators to discipline, combined with good luck, have hitherto enabled us to escape without serious accident does not invalidate or even weaken this argument. There can be no possible assurance that this good fortune will continue.

"Before I introduced this resolution I made an effort to ascertain the state of intelligent opinion on the subject; I submitted the matter to the members of a literary club, to the board of a financial institution, to a large committee made up of medical men and to a number of individuals, some of whom were connected very closely with automobile affairs. Nine-tenths of those to whom I spoke owned cars. They were asked in each case whether or not, if they had the authority and the responsibility of the Park Commission, they would or would not support the resolution. Those who said they would not were in a numerically negligible minority of not more than 2 per cent. A well-known member of the Bar, Mr. George P. Rich, is of the opinion that we have no legal right to permit these races, that an injunction against them would hold, and that in case of damage to person or property we would be legally liable."

As to minor matters, such as injury to Park roads, turf and shrubbery, no complaint is made because "the benefits of a day's outing to the owners of the Park—the people themselves—would more than compensate for this disadvantage, especially as the roads are put in order again by the promoters of the race."

"Inquiry has led me to believe that the races have little or no value as tests of automobiles," says the doctor, "that they chiefly subserve the interests of a small minority of manufacturers; that there are other and harmless ways of trying out engines and tires, and running or steering gear; and that even races may be held—but not on public roads—with far less danger to participants and none to spectators. I am also strongly inclined to think that these particular races involve a disregard of the rights of some of our citizens who will, I know, in the future, ask the courts to protect them."

The resolution has been referred to the Committee on Superintendence and Police for report. In the meantime Dr. White's broadside is met by the convincing arguments that in the four races so far held here under the auspices of the Quaker City Motor Club and the municipal authorities not an accident of any kind to spectator or driver has occurred; that the Park course has been proven safe; that the annual turnout demonstrates its popularity; that the statement that persons are attracted by the element of danger is not borne out by the facts, and that Dr. White's suggestion of a municipal race track is not feasible and couldn't begin to compensate for the attraction of a race in the picturesque and easily-accessible Park.

1912 Racing Season Promises Activity

NEW YORK, Dec. 14—At a meeting to-day of the contest board of the American Automobile Association it was decided to send out letters to all of the clubs and promoting organizations throughout the country, asking them to select dates for their coming contests for the 1912 season, with the object of enabling the board at its next meeting to issue the first draft of the 1912 calendar. Already Indianapolis has asked for Decoration Day and Labor Day for speedway races; Philadelphia has put in a bid for the second Saturday in October for the Fairmount Park 200-mile road race; application has been received from California for a date about the middle of May for the Santa Monica races, and a request has come from Chicago asking for dates in August for the Elgin races. From present indications it would seem that 1912 will be an active one in the road-racing field.

Several drivers came under the ban of the board for participation in unsanctioned events. T. S. Duby was suspended as a driver for two years for competing at De Witt, Iowa, September 15, under the assumed name of Bliss at an unsanctioned meet. C. B. Kent was given six months' suspension for competition at an unsanctioned meet at Madison, Wis., September 24. Application from the New York Motor Club for reinstatement by the board was received but no action was taken. This club was suspended for conducting an unsanctioned meet on July 4.

The board received from the Manufacturers' Association a number of recommendations for changes in the 1912 rules. The different members of the board have suggested many alterations and it is expected that the final draft of rules governing 1912 contests will be completed during the New York show season.

Fig. 1—A portion of the coach department in the new Packard service station in Long Island City

What Makers Are Doing for Buyers

As Illustrated by New York Packard Service System

AT the junction of Thompson avenue and VanDamm street in Long Island City, the Packard Motor Car Company, of New York, completed in October, 1910, the pioneer service station in the metropolitan district—that is, speaking of service as a feature distinct from all other branches of the automobile business and as entitled to a home of its own.

This location was chosen with great foresight. The building faces Diagonal street viaduct over the Sunnyside yards of the Pennsylvania Railroad, the air-line from Queensboro Bridge Plaza to Thompson avenue, which is the main artery for automobile traffic from Manhattan to all points on Long Island. Being thus situated, it cannot escape the observation of the great army of Long Island commuters who daily pass through the busy railroad yards.

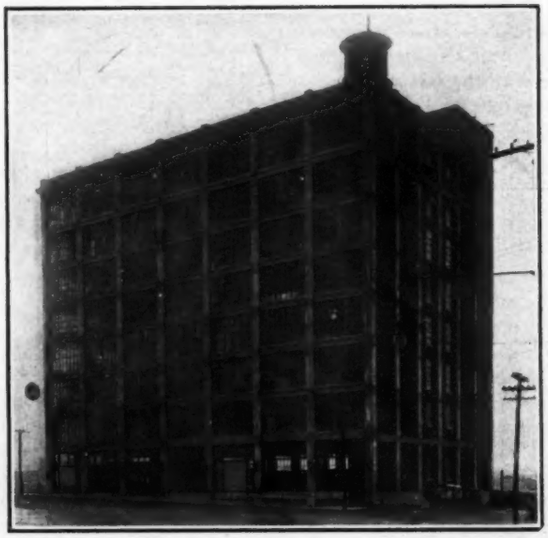


Fig. 2—Exterior view of the building, showing the modern tile and glass construction

The distance of the service station from the company's main office in New York City is 3 miles, an easy 15-minute run by automobile. A delivery service is operated between the two points, carrying passengers, stock, inter-department communications and the like, on a regular schedule of five round trips a day. Telephone tie lines weld the two offices almost into a unit and provide immediate communication on all subjects of mutual importance—a big factor in service efficiency.

The building is thoroughly modern in every respect. It is approximately 150 feet long by 100 feet wide and is constructed of steel, hollow tile, concrete and glass, there being about 24,000 feet of the

Fig. 3—A portion of the body painting department on the fifth floor. Job costs for this department are made up at the right

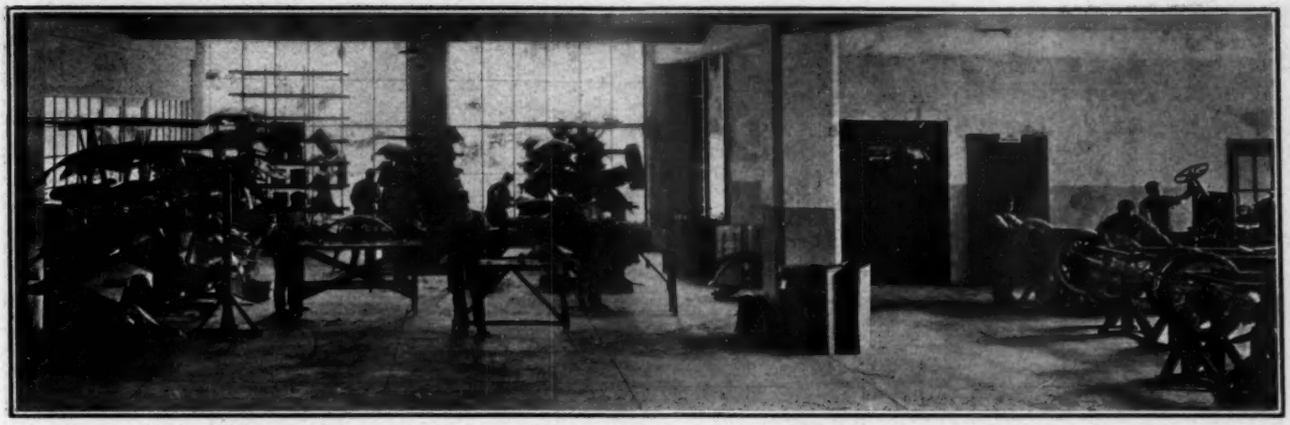


Fig. 4—A corner of the paint-shop is given up exclusively to fender painting. Note the drying racks

last-named material. Eight floors and a basement make up an available floor space of about 200,000 square feet. Some idea of the size of the plant may be gained from the fact that there is room for about 200 cars and 35 trucks in simultaneous process of repair, together with 45 cars and 100 car bodies in dead storage.

Special Features of the Building

Despite the fact that the building is of rigid fireproof construction throughout, there is a most elaborate sprinkler system. A roof tank stores continually 40,000 gallons of water for sprinkler service, and in the basement is a reserve tank containing 75,000 gallons more. These two tanks are inter-connected, and in case of fire, a powerful pump will raise the basement supply into the tank on the roof.

Gasoline is stored in underground tanks outside. These tanks are four in number, of 500 gallons capacity each, connected with pumps located in a small, fireproof outhouse. Oils, kerosene and turpentine are kept in the basement in 150-gallon tanks, the delivery pumps being on the first floor.

Besides the passenger elevator at the east end of the building, there are two freight lifts in the southwest corner. The latter are 12 feet by 17 feet, with capacities of 8,000 pounds and 15,000 pounds, respectively. These do all the heavy lifting, trucks being carried on the 15,000-pound elevator, while pleasure cars and freight are raised on the one of less capacity.

How the Space Is Utilized

It is interesting to note the way in which the large amount of space in this new service station has been used. The eighth or top floor is devoted entirely to truck repairs, and has a capacity of 35 vehicles. It was chosen for this purpose because only a single row of pillars was required to support the roof, leaving a clear space on the north side approximately 66 feet by 150 feet in which to manœuver the bulky commercial cars. The overhead clearance is 15 feet, which is needed to accommodate the taller truck bodies. Like the other floors, it has three full sides of glass, but it differs from them in that it also has a skylight, making an exceedingly well-lighted workroom.

The seventh floor is given over to car repairs, with room for thirty-five machines. On the north side, where the light is best, is the "motor line," or series of horses to hold complete motors during the process of overhauling. Cranes are used to lift the motors from the car frames to the horses. Back of the latter stand the dismantled chassis. Here clutch, transmission and miscellaneous work is carried on.

On the south side are placed the cars which need only slight repair, and here the radiator repair men also work, the few machine tools required being located next to the south windows.

The coach department makes use of the fifth and sixth floors for woodworking, carpenter work, chassis painting and lumber storage. Forty cars can be accommodated on the fifth floor, while the sixth has room for forty-five. At the west ends of both of these floors will be found two banks of lockers in which is stored customers' property removed from cars in process of repair. The office of the coach department is at the east end of the fifth floor, and in it are made up the job costs for this class of work in a manner identical with that employed by the repair department. Along the north side of this floor are the assemblers, while the trimmers occupy the south side.

Fig. 5—Chassis painting section. Each group of painters devotes its time to work on one particular part of the Packard machine

Fig. 6—The stockroom occupies the entire second floor. In it are kept parts for every model since 1904

Painting is done on the fourth floor, which has a capacity of thirty-five cars. Bodies chiefly are painted here, though chassis that cannot be accommodated on the sixth floor are taken care of. Along the north wall at the east end, where it gets light on two sides, is the varnish room, in which the finishing coats are applied under dustless conditions and at uniform temperature. The frame workers, whose work is devoted exclusively to windshields and limousine window frames, and the paint mixers are within an inclosure on the south side next the freight elevator.

The third floor is devoted to dead storage, there being room here for forty-five cars and 100 bodies, as already stated. Along the east, north and south sides are racks of special construction, providing for two tiers of bodies, either open or closed. Cars are stored in the center of the floor and are arranged with a view to convenience in the matter of shifting.

The entire second floor is given over to the stockroom. Within an inclosure of some 13,000 square feet is stored the supply of parts and accessories necessary to provide for the Packard owners throughout a wide range of territory. At the east end of the inclosure is the customers' window and at the west end of the floor, outside, is the receiving and shipping department, to which all incoming shipments are delivered, and from which all outgoing orders are sent.

Forty-five cars can be accommodated on the first floor, which is used for quick service, storage of finished machines awaiting delivery and the like. At the east end is located the superintendent's office, with accommodations for stenographers, telephone operator, checkers, etc. The south side is taken up by four vehicle entrance doors, one to each freight elevator and one at either end of the floor proper.

The Packard Service Methods

A description of the Packard service methods must begin with the stockroom. For service efficiency a stockroom must have an adequate supply of all parts and accessories for which instant demands occur.

This Packard stockroom must provide for the needs of its two fellow service departments, the repair shop and coach department, for customers' direct orders, for stock orders from the New York stockroom and for the branches at Newark, N. J., Hartford, Conn., and Springfield, Mass. In a word, it is the central distributing point of the New York company.

The orders of the repair shop and coach department are presented in the form of requisitions chargeable to repair orders in hand as hereafter described. They come in duplicate by way of a dumbwaiter running between the floors. One man is

Fig. 7—The pleasure car repair shop. Men working on the motor are stationed nearest the windows to get the benefit of all the light possible

Fig. 8—View in the dead storage department. Racks are provided for the storage of two tiers of bodies, as shown

delegated to receive them and follow them through for quick delivery. It is his duty to act as personal representative for the other two departments, and if there are delays or errors in filling requisitions, he is the responsible party. He rarely fills requisitions himself, but stays at his post to receive them, to hasten the men who do fill them and to check the filled orders for accuracy. His location is such, in relation to the customers' window, that he can serve it after the same fashion.

Customers' and branch orders are handled after much the same methods as those employed by any well regulated plant. A record of each order of any sort is made on a perpetual inventory, which is charged with all stock received, credited with all delivered and posted with the date and quantity of every order. It is subdivided according to models and each part of every year's car has its danger limit. The interchangeability of parts, which is a feature of the company's construction policy, tremendously reduces the number of individual entries in the record, but it nevertheless entails an immense amount of work.

When the order calls for work that will detain the car for from two days to several weeks, the check includes everything in detail and a copy is sent to the customer with a request to report promptly any shortages noted. When the order calls for short jobs only, the check includes merely the readily removable equipment. Copies of all complete checks are interchanged between the New York office and the service station. Discrepancies at either point are immediately investigated.

Cars come from the New York office accompanied by orders and checking sheets, all of these typewritten with four copies. The repair shop receives one, the coach department two and the head tester, who is also finished inspector, one. Frequently the attention of but one department is required, but it is necessary for each to have its own record of the order, as either department may be called upon for work by a supplementary order.

After being "checked in," each car is sent to the floor where work on it is to begin. Cars to be stripped or relieved of light equipment are handled first by the assemblers, who remove whatever is to be locked up for protection and place it in the lockers already mentioned. The car is then delivered to either the repair or coach department according to the nature of the work which is to be performed.

It is seen that the Packard Company has worked out its system well, such exhaustive methods being necessary on account of the volume of its business. In an ordinary month there are approximately 400 cars and trucks which apply at the plant for repair of one form or another, and the company's aim is to meet this demand for its service in as satisfactory a way as possible.

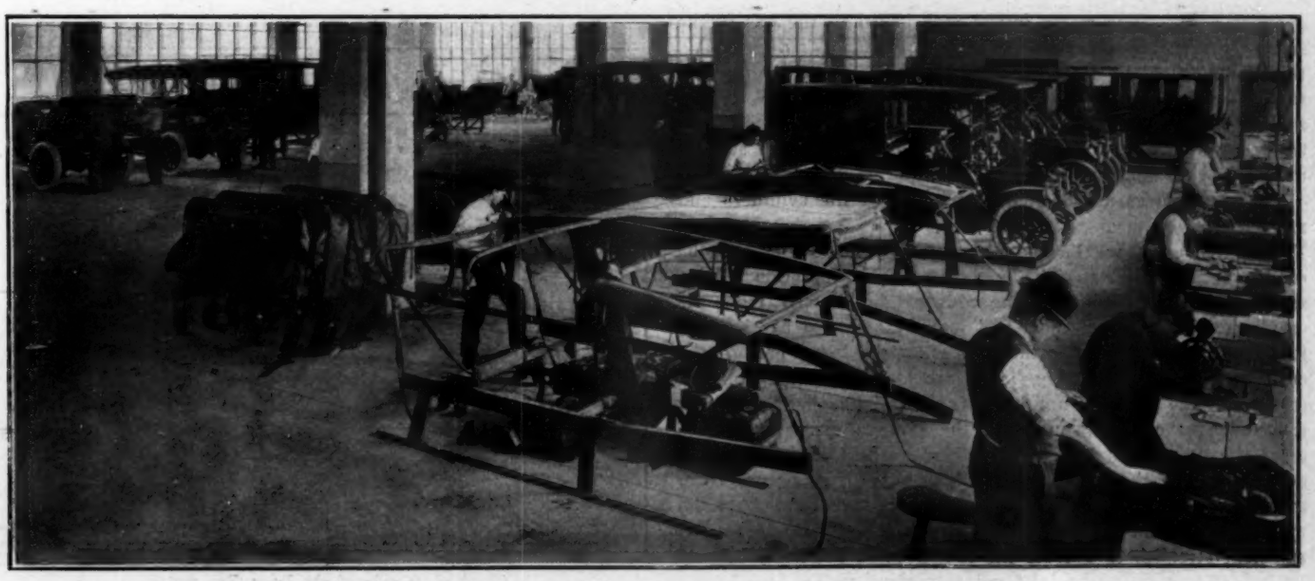


Fig. 9—A large section of the coach department is devoted to upholstering and top making

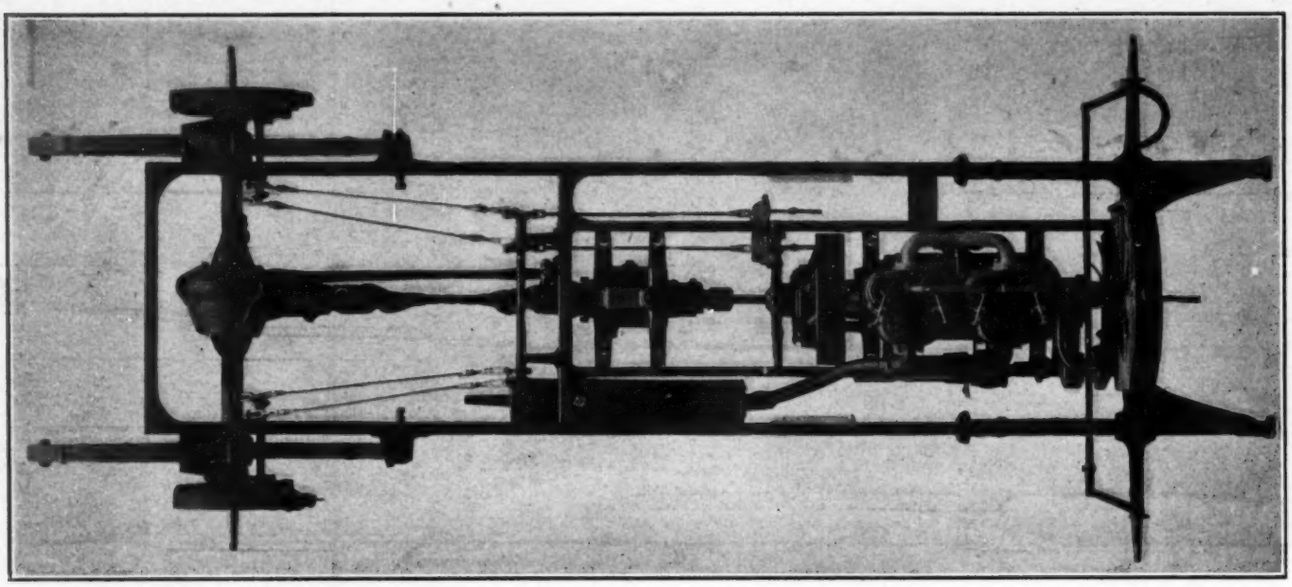


Fig. 1—Chassis of the Olds production known as Reo the Fifth; standard for all types of bodies

Reo the Fifth--Olds' Latest Model

WHAT is announced as the greatest achievement of R. E. Olds has been brought forward under the name of Reo the Fifth. It is fitted with a 30-horsepower motor and the chassis is provided with bodies of the five-passenger touring, baby tonneau and two-passenger roadster types.

The motor has four cylinders, which are cast in pairs. The water jackets are cast integrally with the cylinders and are of large dimensions to insure a positive circulation and avoid pockets in the cooling space. The motor is illustrated in Figs. 2 and 3, which show the left and right sides of the motor respectively. The bore of the motor is 4 inches and the stroke 4 1-2 inches, giving a stroke-bore ratio of 1.12. The intake manifold is of the Y-type and connected to the cylinders by means of stud bolts which pass through flanges on the intake manifold and into bosses cast integrally upon the exterior of the cylinder walls. The water intake pipe is led to the gas intake side of the motor through the small pipe shown in Fig. 2, and this is connected in a similar manner by means of flanges and stud bolts. The intake manifold is flanged at the Y and is so designed that as it leads from the carbureter to the Y it tapers gradually from a circular section to an elliptical section, the area being constant for the whole of this distance.

The inlet valves are located at the top of the cylinders and are operated by means of rocker arms driven off the camshaft. The rocker arms are located above the cylinders and may be readily seen in Fig. 3. The method of their operation is also shown in this illustration. The rods extend directly from the crankcase to the rocker arm and may be adjusted by the nuts located at the point where the rods enter the lower part of the crankcase casting. Stuffing boxes are located at this point in order that the oil does not leak from the base chamber to the exterior of the motor and give the same a dirty appearance after the motor has been running for a short length of time, not to mention the waste of oil which very often occurs from this point. The springs for the inlet valves are located on the upper part of the cylinders upon which they seat and are of sufficient strength to operate the rocker arms positively to preclude lost motion in the inlet valve mechanism.

The exhaust valves, located on the right side of the cylinders, are surrounded by the water jacketing to keep the parts, which are submitted to the excessive heat of combustion, as cool as possible. In order to make the cooling of the valve ports as certain as possible the water is led directly from the water intake to the exhaust valve and from there is allowed to circulate through the remainder of the jacketing. The exhaust manifold is connected to the cylinders in the same manner as the intake manifold. Larger bolts are of course used to sustain the greater weight. The manifold droops downward in a slow curve at the rear end so that there will not be any excessive back pressure produced at this point. The exhaust valve stems are upon the same side of the motor as the rods which operate the rocker arms for the intake valves. The adjustments for the valves are made in the same manner, the device consisting of a nut above

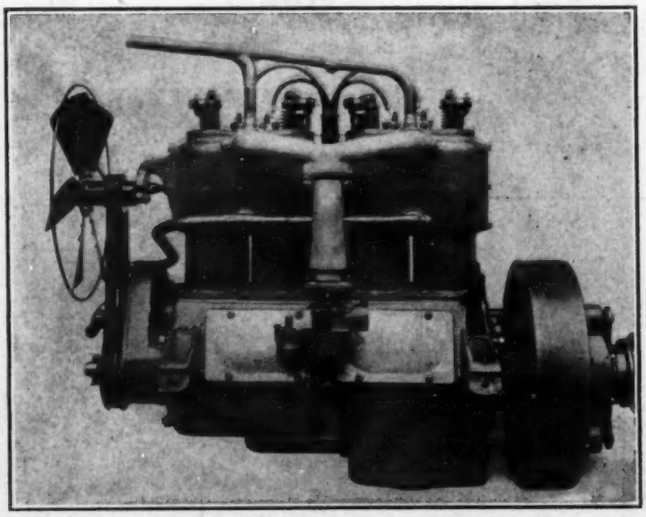


Fig. 2—Left side of the latest Reo motor

which there is a sort of cup in which the tappet rods rest. When there is any lost motion due to wear these nuts are turned in order to take up the space between the cup and the end of the tappet rods when the cams are at the lowest point. These points of adjustment are very accessible and are all upon the same side of the motor and at the same height so that they may all be inspected at the same time and the adjustment so regulated that they will be the same for each of the valve stems. In order to facilitate the inspection of the valve operating mechanism there is a cover plate over the lower part of the crankcase, which, when removed, discloses the entire cam action. This cover plate is held in position by means of stud bolts and dogs which pass over the cover plate. The stud bolts, of which there is one to each dog, pass through the center of the dogs and through the metal of the crankcase into bosses in the metal.

When it is desired to inspect the cams for wear or in case of trouble with these parts the bolts are removed; the dogs are then lifted out of place and the cam action is disclosed. The camshaft itself may be inspected or cleaned through this opening. The camshaft bearings may be removed through the opening, without disturbing the cams, by simply unscrewing the cover plates of the bearings. Inspection for wear in these places may be readily made in this manner without the expenditure of a great amount of time or labor.

The pistons are of gray iron castings, as are the cylinders, and are fitted with three sprung rings above the wristpin. The latter member is of steel and is provided with a bushing to take the bearing at the upper end of the vanadium steel connecting-rod. This is made as long as is consistent with a low engine, in order to reduce the thrust on the side walls and at the same time to keep the center of gravity of the car as low as possible. In order that the connecting-rods may be reached without removing the cylinder castings from the crankcase, there are hand-holes in the latter casting by means of which they may be examined and any adjustments readily made. Adjustments on the crankshaft bearings are made from the exterior of the motor, hence there are no assembling operations necessary after these adjustments have been made.

The cooling-water is circulated by means of a centrifugal pump located at the front end of the magneto shaft, which is extended forward for a considerable distance beyond the extremity of the crankcase on the right side of the motor. It is attached to the radiator by means of a short rubber tubing and draws the water directly from it. The water is then led through a nickel-plated tube to the opposite side of the motor and thence to the water jacketing. The outlet manifold is placed upon the top of the motor and slopes gradually upward to the top of the radiator, which is of the vertical tube type.

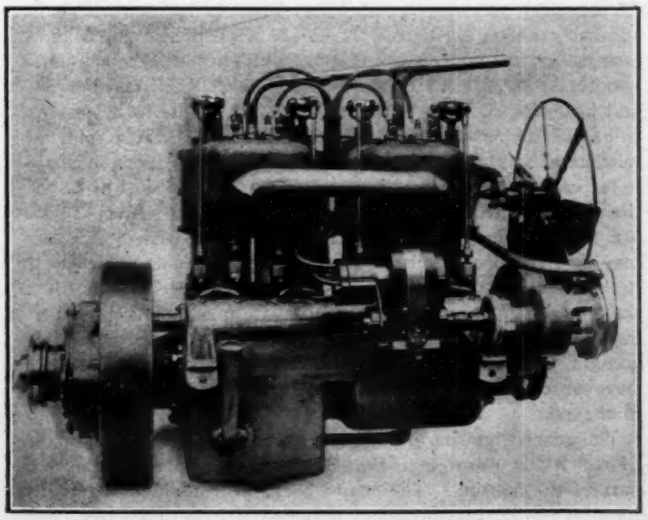


Fig. 3—Showing the right side of Reo motor

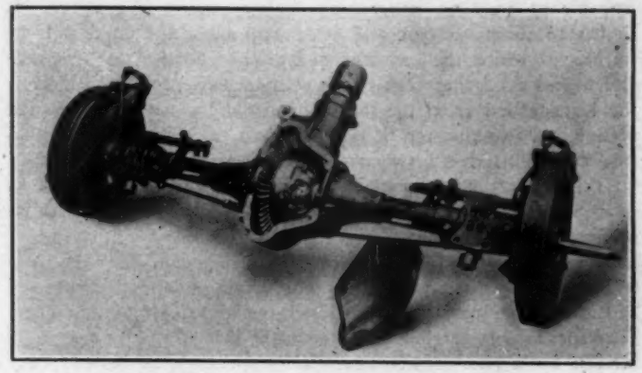


Fig. 4—A view of the rear axle with cover removed

Lubrication is effected by means of a combination of the force-feed and splash systems. The oil reservoir is located in the lower part of the crankcase casting, which is of aluminum. The main supply of oil is carried in the tank formed by the depression of this casting, the capacity being in the neighborhood of 3 quarts. The filler hole is located on the right side of the motor near the rear end and is placed on the end of a tube which is an integral part of the filler. This filler tube is cast with a flange at the bottom by means of which it is held to the bottom of the crankcase by two bolts which pass into the base chamber. There is a screen in the filler hole through which all the oil must pass that is poured into the tank; this will insure a clean supply of oil to the tank at all times so far as any impurities which may be in the original supply are concerned.

The oil is taken from the tank by means of a plunger pump and led through the main lead to the main bearings, which are thereby lubricated. After passing through the main lead the oil flows into troughs, which are held upon a horizontal tray in the base chamber. These troughs are at such a height that the bottom of the connecting-rods will plunge into the oil for a distance of about 3-8 inch when they are full. The oil is caught up on the projections on the bottom of the connecting rods and beaten into a spray which pervades the entire crankcase, thus lubricating the pistons and all other moving parts within the motor. The camshaft bearings secure a liberal supply of oil by this means and there is at all times a mist of oil within the pistons themselves which will find its way about the oscillating bearing of the wristpin.

Since there is a superabundance of oil supplied by the pump there is no danger of the end troughs running dry either when ascending or descending a hill. However, there must be some means of permitting the excess oil to overflow so that the motor will not smoke. This is provided for by a series of overflow standpipes in the crankcase. The oil will pour through these whenever it reaches a point above the top of the splash troughs, and in this manner again reach the reservoir. In order that the supply be cleaned before it is again circulated through the lubricating system a screen is introduced through which the oil must pass on its way to the pump.

At the bottom of the reservoir there is a drain plug which may be removed for the purpose of draining out all the oil before renewing the supply. A separate oil lead takes the oil from the pump to the timing gear case at the front end of the motor, the revolving gears serving to distribute this oil about the case so that the gears work in oil and are at all times amply lubricated. After leaving the timing gear case the oil flows by gravity to the splash troughs in the same manner as it does after leaving the main bearings. The gearset and the differential are lubricated in the same manner as is usually employed in these parts. They are packed in non-fluid oil and are covered by grease-tight housings.

The carbureter fitted to the new car is so designed as to be

capable of handling either high or low grades of gasoline. It is of the automatic type and fitted with a hot air intake pipe by means of which the gas admitted to the cylinders is kept uniform under varying climatic and atmospheric conditions. It is held suspended from the intake manifold by means of a broad flange and two through bolts which pass through the flange and the gasket inserted between the faces to guard against leakage at this point. Adjustment points are rendered as accessible as possible on the carbureter so that it may be readily set without taking it from the motor.

A low-tension magneto is fitted with supplementary dry batteries for starting purposes. The magneto and coil are of National make and produce a high-tension spark at the plugs. The magneto is carried upon the right side of the motor; it is driven by a short shaft which also operates the water pump upon its other extremity. The timer and coil are connected directly to the magneto, the wires being led straight to the spark-plugs after passing through a tube located between the two pairs of cylinders and fastened thereto by means of a metal strip which passes from the nuts which hold the rocker arms of the two central cylinders, around the tube which carries the wires. The tube is bent out toward the right side of the motor at the bottom, thus leading the wires directly to the magneto without allowing them to rub across any edges which could cause the insulation to chafe and eventually lead to a short circuit. The magneto is held in place by means of a metal strap which passes over it and holds the instrument tightly upon the shelf which carries it. Should it be desired to remove the magneto this can be effected by unscrewing the nut which holds the shaft in place, disconnecting the shaft and then withdrawing the magneto. The batteries or magneto may be used at the discretion of the operator by the manipulation of the switch which is located on the dashboard.

A change has been made in the location of the flywheel; it is set back 2 inches farther on the new model than on the models of the past year so that longer bearings may be used and the tendency toward vibration decreased. The clutch is located in the flywheel and is of the multiple disk Reo type, having alternate disks of bronze and steel. The housing is an integral part of the flywheel and may be seen in either of the illustrations of the motor. The clutch spring is inclosed and held in place by the casing cover, which is fastened by three stud bolts passing into the clutch housing. When these bolts are removed the whole clutch may be readily disassembled for inspection. The clutch is controlled by pedal in the usual manner except that it is manipulated by the left foot. The flywheel is so marked that it is possible to take down the motor and set it up by means of these markings and still have the same timing. The marks consist of chisel cuts and the initials of the operation which is taking place at the time that the chisel mark is opposite the indicator on the engine frame. In this manner the opening and closing of both inlet and exhaust valves on all the cylinders are shown as well as the time in which any of the pistons reach either the top or bottom dead center.

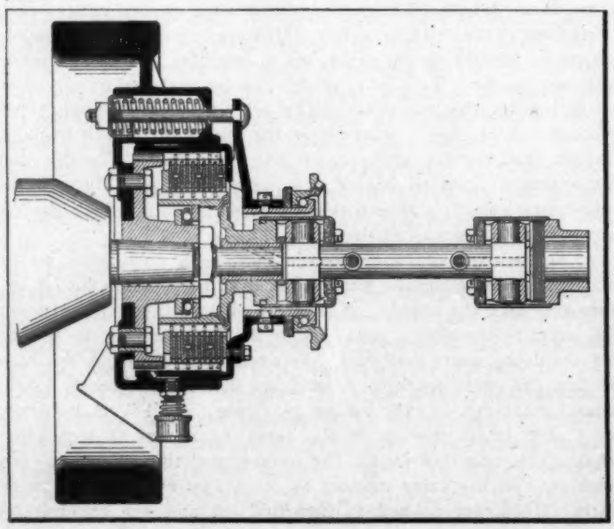


Fig. 5—Detail of the clutch used on Reo the Fifth

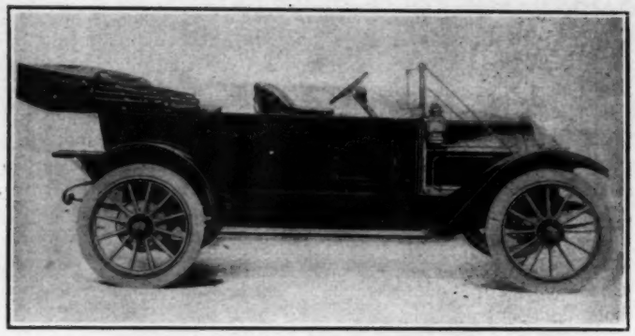


Fig. 6—Showing the five-passenger touring car for 1912

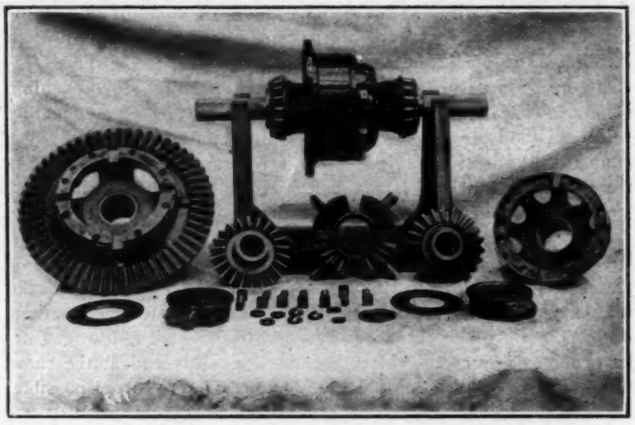


Fig. 7—A disassembled view of the differential gearing

The gearset is of the three-speed and reverse selective type. It is of compact design, as may be seen in Fig. 10, where it is shown in section. The gear-shift lever is of peculiar design, being fitted with a ball handle instead of the usual grip type of handle. The lever is located in the center of the car in a transverse direction, being on the right side of the driver, who occupies the left seat in this car. The gearset is very similar to that used on the Reo 1911 cars except that it has Timken bearings on the upper shaft and Hyatt high-duty bearings on the countershaft. The drive shaft is of nickel steel, bar hardened and heat treated; it is separated from the clutch by a universal joint, the casing of which is packed in grease. This joint will take care of any changes in alignment due to road shocks or other causes, and is kept continually supplied with lubricant by the grease which is fed to it through the gearset casing. Drains are fitted in the gearset housing by means of which the gears may be cleaned out and the supply of grease renewed whenever it should become necessary. The maximum travel of the top of the gearshift lever is 3 inches, so that in whatever position it may be located it should never be in the way of the driver. On account of the central location of the lever it is possible to leave or enter the car upon either side in the front as well as in the rear.

The gearset housing may be taken down by removing the bolts, of which there are eight, that hold the cover plate to the main part of the housing. The gear wheels, bearings and shafts may then be readily inspected and removed if it be necessary.

The drive is taken up beyond the gearset by means of a nickel

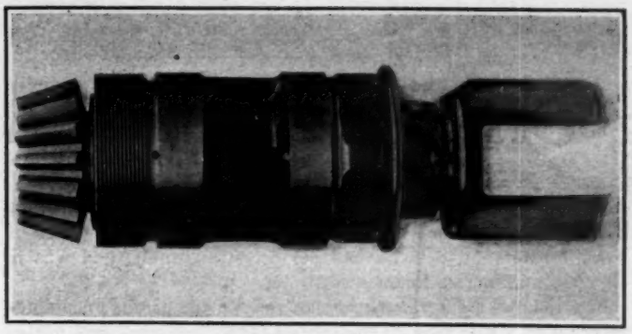


Fig. 8—The drive pinion of the differential is an integral member

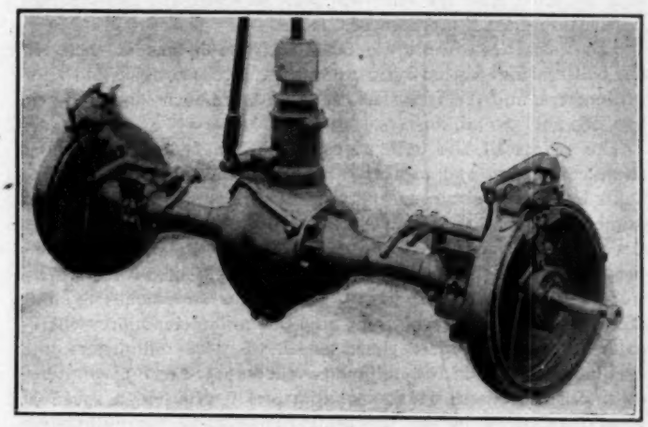


Fig. 9—Illustrating connection of torque rod to rear axle housing

steel propeller shaft separated from the gearset by means of a universal joint of the pin and block type to take care of the changes in alignment due to the varying passenger loads. This universal joint is also inclosed in a casing and runs in a bath of oil. At the rear end of the propeller shaft another universal joint of the same type is fitted and equipped with an oil-tight casing in the same manner as that just mentioned. The power is transmitted through this to the differential housing, which forms an integral part of the pressed steel casing in which the rear axle is contained. Leather boots are fitted over the universal joint casings, thus effectually sealing the part against the intrusion of any dust or grit, and at the same time keeping the part clean in case it is desired to do any work upon the universal joints.

The drive pinion through which the power is transmitted to and differentials is shown in Fig. 8; it is an integral part of the short shaft between the universal joint on the rear of the propeller shaft and the system of gearing in the differential casing. These gears are shown disassembled in Fig. 7; they are of heavier construction than those used heretofore in Reo cars and are made with the idea of noiselessness. To further this end they are carried upon roller bearings of Timken make throughout, while the fact that the drive pinion is connected integrally to its shaft does away with any possibility of lost motion due to wear at this point.

The rear axle is of the semi-floating type, being carried throughout on roller bearings of the Timken type, except that at the wheels the bearings are of the Hyatt high-duty type. Flanges upon the differential casing, to which are bolted the corresponding flanges of the axle shaft casing, form the means of connection between these two members of the rear axle housing. They are both of pressed steel. The accessibility of the differential may be judged from the view shown in Fig. 4, where the cover plate is illustrated as removed from the differential. The gearing, shafts and bearings are exposed sufficiently for the performance of any necessary adjustments. Torque rods are fitted to the rear axle housing for the purpose of stiffening the structure of the chassis and to avoid all torsional strains when making sharp turns or otherwise placing excessive strains upon this part of the mechanism.

The brakes are shown in Figs. 4 and 9; they are of the external and internal types, working upon 14-inch drums on the rear axle. The service brakes are of the external contracting type and are faced with thermoid. These brakes are operated by means of a pedal from the driver's seat. The emergency brakes are of the internal expanding type, working upon the same drums as the service brakes and faced with the same material. They are also controlled by pedal. Springs are fitted which keep the brake bands from dragging on the drums while they are not in use. Both sets of brakes are equipped with equalizers which distribute the pull on both brakes so that they are applied simultaneously and with equal pressure on the drums.

The frame is of Reo manufacture, the side members being of channel section and of single drop construction. The depth of the channels is 3 9-16 inches with 1 1-2-inch flanges. The front axle is of I-beam drop forged construction, having a single drop; the cross rod is to the rear of the axle. The chassis frame is supported upon 3-4 elliptic rear springs 2 inches in width having seven plates, and semi-elliptic springs in front having the same number of plates and being of the same width. The span of the springs is 38 inches. The steering gear fitted with the chassis is of the gear and sector type.

The wheels are 34 inches in diameter all around, and wheelbase is 112 inches. The equipment consists of three oil lamps, two gas lamps, generator, horn and complete tool and tire outfit for both the four and five-passenger touring models and the roadster.

British Favor Low-Power Cars

Day by day it is becoming more impossible in England to sell motor-cars of high horse-power. This is not entirely due to the fact that the popular demand of the times is for cars of moderate horse-power. Those who can afford to go to the expense are still keen upon such vehicles. But there is a vast difference between the 40- and 60-horse-powered automobile of to-day and the corresponding type a few years ago. While the modern car gives all the horse-power it is rated for, the oldtime car, with its enormous bore and short stroke, rarely ever gave within more than 75 per cent. of its nominal power. It has been suggested that in order to do away with the present tax on horse-power and still raise a corresponding amount of revenue, the taxation on gasoline should be materially increased.

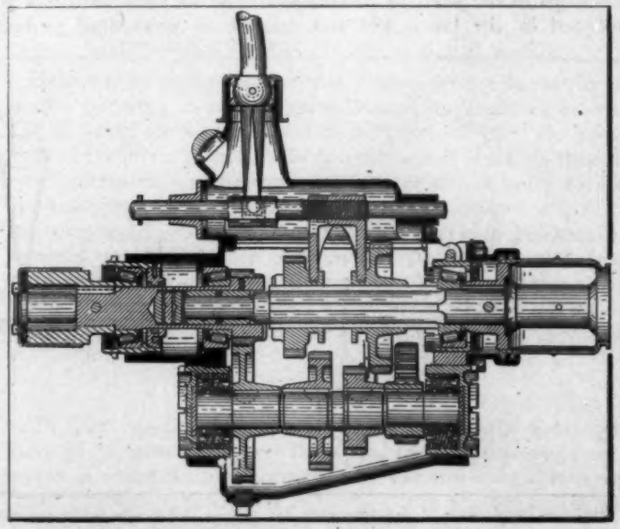


Fig. 10—Section through the gearset of Reo the Fifth

Destructive Driving-Shaft Oscillation

UNDER certain conditions of design, rapid wear of bevel gear on the rear axle of shaft-driven cars is observed and also of the universal joints on the shaft. And with some frequency it is noted that the ball bearings in which a cardan shaft is mounted at or near its ends, as well as ball-bearings on floating rear driving axles, are injured, without the injury being easily explained by the stresses to which they are considered subject. Some light is thrown on the causes which may be at work, and consequently also on the best means for avoiding the troubles referred to, in an article appearing in a German contemporary and rendered in substance in the following.

It had been observed that many cars equipped with bevel gear and shaft drive became noisy in the rear axle mechanism as soon as the motor speed reached a certain number of revolutions, and Engineer T. Lehmbeck undertook to investigate the cause of this phenomenon at the testing laboratory of the German Arms and Ammunition Works at Wittenau, Berlin, in conjunction with Engineer Bockermann, the superintendent of this laboratory. No attempt was made in the experiments to determine the rhythmic effects which may be caused in the operation of a car through coincidence or certain arithmetical relations in the vibrations of various parts with those of the driving shaft, as this would lead to great complications and to results which would not be generally applicable. The object was to decide by graphic methods the general principles ruling the harmful vibrations of driving shafts according to the length of the shafts, their design and the location of the fixed bearings in which the two ends—adjacently to the universal joints—are mounted. The trials were made with plain shafts of different lengths mounted in two ball bearings adjustably secured on the bed plate of a heavy lathe. One end of the shaft was coupled by means of an Eisemann joint with the shaft of a separately mounted electric grinder ordinarily used for micrometric material tests in the laboratory. An intervening expansion pulley drive admitted the variation of the number of revolutions from 500 to 3,500 per minute.

In order to measure the magnitude of the vibration of the shaft at the critical number of revolutions, a measuring apparatus was constructed consisting in a contact lever C with a lever arm ratio of 1 to 10. On account of the momentums this could not be laid upon the shaft, but the end of the index lever was taken in the hand of the operator and the contact point was cautiously approached to the shaft by turning it around its pivot until it was touched by the latter, and this manner of proceeding proved itself sufficiently exact to insure very accurate determination.

The shaft first used was turned and ground to a diameter of 30 millimeters (1.58 inch) and perfect straightness, and was in all 1,760 millimeters long.

Fig. 1 shows a diagrammatic plan view of the arrangements, together with a side view of the contact-lever apparatus, and it may be noted that the driving shaft A to the right of the coupling B is mounted upon the same bed plate to which the ball-bearings of the test shaft S are secured.

The first series of tests was made with the distance L1 between the ball bearings variously adjusted to 1,600, 1,400, 1,300 and 1,000 millimeters, and the free shaft ends L2 were correspondingly 80, 180, 280 and 380 millimeters.

The radius of the oscillations of the shaft resulting under these conditions, and measured at its middle, are shown in the solid lines of the curvograph, Fig. 2. That there is a critical number of revolutions corresponding to each shaft length (between the bearings) is at once noticeable. Soon after this number is reached, the vibrations subside quickly in all cases. By 1,480 revolutions, the radius of the oscillation reaches 8 millimeters, and at 1,570 revolutions only one millimeter more, whereafter it drops. With a shaft length of 1,400 millimeters, the oscillation reached a 7-millimeter radius at 2,030 revolutions. With a shaft length of 1,200 millimeters it required a speed of 2,725 revolutions before the oscillation became 6.5 millimeters and, when the shaft length was reduced to 1,000 millimeters, 3,070 revolutions produced an oscillation of only 2.5 millimeters. The power of the motor was insufficient to reach the maximum oscillation for the shaft lengths 1,400, 1,200 and 1,000.

In the second series of experiments it was the object to ascertain what effect the free ends of the shaft have upon the oscillations of the latter, and for this purpose another shaft of 1,850 millimeters length was employed. The bearings were placed 1,750 millimeters apart as in the first series. Subsequently, the shaft was made 250 millimeters shorter for each successive test, and the distance between the bearings was reduced the same, so that the free ends remained at the same length of 50 millimeters in all the tests. The curves shown in broken lines in Fig. 2 indicate the results recorded. The oscillations were plainly much less pronounced than in the first series.

In practice the conclusions of the experiments may be summarized as follows:

First, when the cardan drive shaft is mounted (in ball bearings) as close as possible to its ends, the calculation of the critical number of revolutions may be made according to Stodola's formula for a freely suspended shaft, but it is possible that even such short shaft ends as those of 50 millimeters, used in the second series of tests, exert an appreciable influence.

Stodola's formula calculated for steam turbines gives the critical number of revolutions as numerically equal to $\frac{r \times 10^4}{L^2 \times 1633}$, in which r is one-half the diameter of the shaft and L one-half the length of the shaft, both in centimeters. In applying this formula, L is to be considered as one-half the length between the ball bearings; that is, one-half of L1 in Fig. 1.

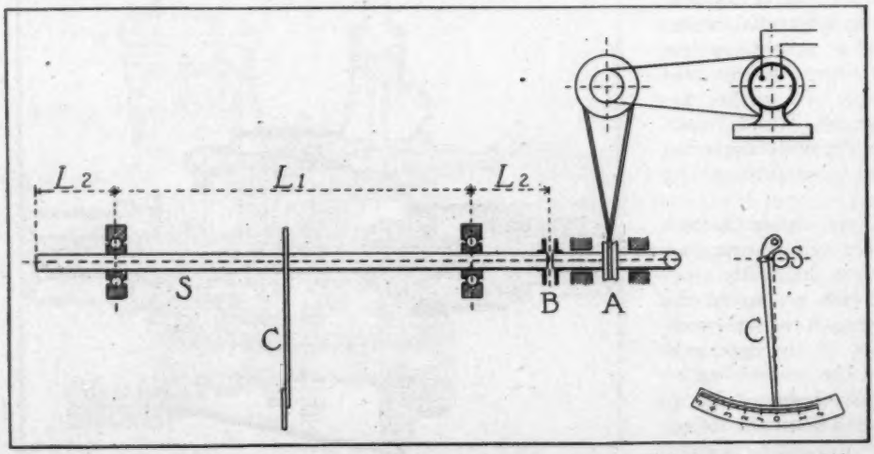


Fig. 1—Grand plan of arrangements for testing end-driven shafts for oscillation—with separate side view of contact index device

Secondly, the longer the shaft ends are which project from the ball bearings to the power at one end, and to the work at the other, the greater will be the oscillations of the shaft and the greater the loss of efficiency.

At the lower end, all cardan shafts are quite closely coupled with the small bevel gear pinion, but at the upper end there is frequently a considerable length projecting, and this explains why so many cardan shafts oscillate violently. In some cases the oscillations become so pronounced that the shaft strikes the enclosing tube and in the course of time spins it into the shape of a taper, as may be observed in a certain French construction. In some Adler cars with long cardan shafts the tube is flanged and joined at the middle to make room for a special ball-bearing to support the shaft at this point. Other constructors use lignum vitæ bearings, but with less satisfactory results.

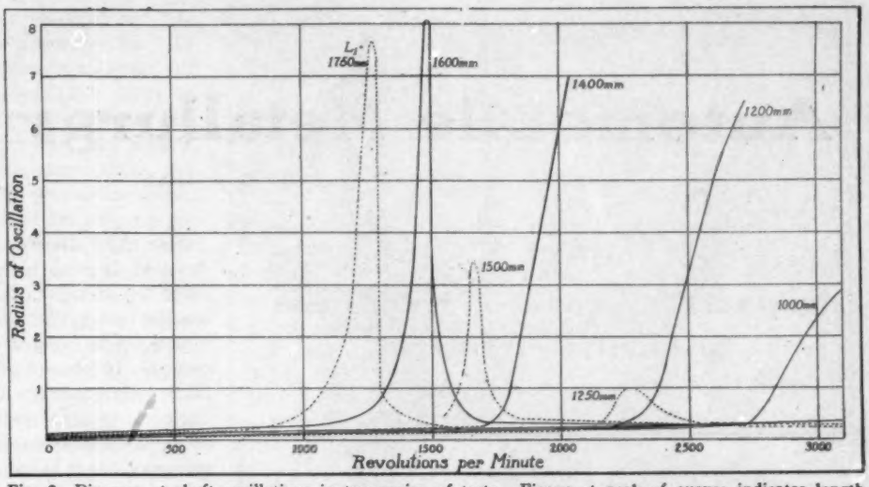


Fig. 2—Diagram of shaft oscillations in two series of tests. Figure at peak of curves indicates length of shaft between bearings

With regard to the design and workmanship of the shafts, it is of the first importance that they are perfectly straight, so as not to have oscillations from the start. Shafts which have not been turned will rarely run straight, and the slightest incipient oscillation causes an extremely rapid increase of the oscillation radius and soon results in the complete destruction of the ball-bearings at the ends. A good cardan shaft should be accurately turned with the diameter increasing toward the middle, and it is false economy to choose the dimensions too small, as a thin shaft of course vibrates much more than a heavier one and in course of time surely destroys every part coming in contact with it.

Further, a tubular shaft can probably never be made so uniform in the thickness of its walls as is required to avoid that centrifugal forces make themselves felt. The centrifugality starts the oscillations and then, when the critical number of revolutions is also reached, the destruction of even the most substantial ball-bearing is only the work of a moment.

With regard to the location of bearings, the practice of providing these, in the case of a simple cardan shaft, only at the lower end, while leaving the upper end at the universal joint unsupported, is to be condemned. To be sure it works as has been demonstrated often enough, but in that case the universal joint itself must be securely mounted in bearings and must be of very generous dimensions in order to resist the extremely high stresses which are set to work through the oscillations.

Oscillations of the cardan shafts may be recognized by the humming of the shaft at the critical number of revolutions and also by the noise suddenly emanating from the bevel gear on the rear axle; the cause being simply that the oscillations alternately increase and diminish the stresses in the mesh of the gear teeth.—From *Zeitschrift des Mitteleuropaeischen Motorwagen Vereins*, No. 21.

Three Cents a Mile for Car Operation

How much does it cost to run a 15-horsepower motor car 15,000 miles in one year? Here are some figures, based on actual facts, from experience and submitted by Mr. D. C. Defries, chairman of the Motorists' Mutual Co-Operative Society of England.

Tire replacement	$173.56
Petrol, 750 gallons at 27 cents the gallon	202.50
Lubricating oil, 50 gallons at 41 cents the gallon	20.50
Full insurance against all risks	45.00
Sundries (about)	25.00
Total	$466.56

The above figures do not include chauffeur's wages and garage hire. But Mr. Defries assumes that a man who does not employ a chauffeur, the work of cleaning the car being done by his gardener, should be able to run his car 15,000 miles on an outlay of less than $500 for the year. This amount of mileage per annum in England is nothing out of the ordinary and especially among physicians, who make strenuous use of the automobile in their professional circuits. One of the American automobile engineers who visited England during the Olympia Motor Car Show is quoted in the press as having designated 5,000 miles as the average year's run of an automobile in the United States.

British Motor Imports Increasing

The following tables show the amount of British imports, exports and Foreign and Colonial re-exportations of motor cars, chassis and parts during the month of October, 1910 and 1911:

IMPORTS.

	October, 1910 Number.	October, 1910 Value.	October, 1911 Number.	October, 1911 Value.
Cars	329	$547,525	525	$655,535
Chassis	529	660,695	493	627,540
Parts	...	837,845	...	956,210
	858	$2,046,065	1,018	$2,239,285

EXPORTS.

Cars	454	$879,210	630	$1,309,195
Chassis	47	95,165	79	147,405
Parts	...	551,855	...	600,780
	501	$1,526,230	709	$2,057,380

FOREIGN AND COLONIAL RE-EXPORTATIONS.

Cars	93	$150,535	155	$279,385
Chassis	16	26,410	97	154,490
Parts	...	132,820	...	98,150
	109	$309,765	252	$532,025

Compulsory Colors for Public Cabs

Hereafter all public gasoline motor cabs operated in the city of Berlin, Germany, must be "marstallbraun" (a shade of brown) and all public electric cabs must be in "ivory colors." The president of the police board has so decreed, and, it is stated, that the principal reason for this restriction is to be sought in the excessive decoration, in loud colors and extravagant designs with flowing wreaths, luscious bunches of grapes and even bacchanalian symbols, by which the cab companies of the gay German metropolis have heretofore found it expedient to meet the supposedly vulgar taste of the populace. Even those who object to the prescribed monotony on principle are inclined to look upon it as the lesser of two evils.

To Keep the Oil From Carbonizing—The Metallurgique company of Montbard-Aulnoye, Paris, has the German patent on a piston in which there is a groove near the top, somewhat larger than the piston ring grooves to be filled with non-conductive material.—From *Der Motorwagen*, November 10.

Automobile Metallurgy Made Easy

By E. F. Lake

Part V

Impact—Vibration—Hardness Shearing—Bending

(Next Week—Bessemer Steel)

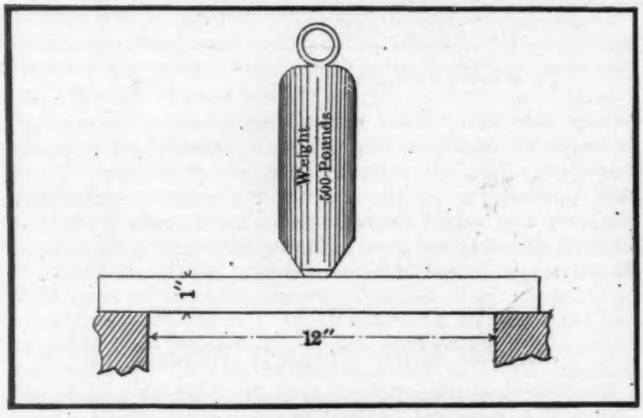


Fig. 1—Impact test

AUTOMOBILE materials have been given a number of strength tests, other than those mentioned in the four preceding articles. Nearly all of these tests parallel different kinds of strains and stresses that various parts are submitted to and they are all useful in their way.

All parts of the automobile vibrate continually while the car is in motion. Tests that will show how materials will withstand this vibration are thus beneficial. These tests consist of two kinds, namely, alternating and rotary vibrational tests. The front axle, frame, springs and the other parts that do not revolve are constantly subjected to alternating vibrations in a moving car, while revolving parts, such as the various shafts, are submitted to rotary vibrational strains.

Alternating vibrational tests are usually made by gripping a test bar, 6 inches long, by one end and then moving the other end 1-4 of an inch in opposite directions from its center line. This keeps the bar continually bending back and forth and the number of bends it will stand before breaking is given as the result of this test.

The rotary vibrational test is given by revolving the test bar at the same time that it is moving back and forth out of its center line. The bar tends in both directions with each revolution and the number of revolutions it will stand before breaking is given as the result. Crankshafts, gearset shafts, driving shafts and rear axle shafts all revolve to drive the car while it is traveling over the road, and they are being vibrated at the same time, by the car coming in contact with the road's uneven surface. Hence the rotary vibrational test shows how long different materials will stand this kind of work.

Impact tests are also given steel. These consist of resting the test bar on two supports that are a given distance apart and then dropping a weight on the bar, centrally between these two supports. This should weigh a given number of pounds and be dropped from a given height. Fig. 1 shows how this test is made. A straight edge laid on the test bar will show the deflection in inches that each blow causes, and thus its resistance to impact. The number of blows before the bar breaks is also recorded. If instead of dropping the weight a pressure were applied to it gradually the transverse strength would be obtained. This test is often used for cast iron and the number of pounds of pressure that is required to break each square inch of the specimen's area is recorded. Pendulum impact tests are made by swinging a weight against the test piece in the same manner that a pendulum swings. The foot-pounds required to break the specimen are given as the result. Impact tests are used very little for automobile parts, but they are well adapted for metals used for some other work. Railroad rails, that continually have heavy weights, in the shape of loaded cars, rolled on them between the supporting ties, are good examples of the need of this test.

Shearing tests are carried on for the purpose of showing how much a metal will stand before it shears off or cuts in two. This test is very applicable to the testing of rivets. The different

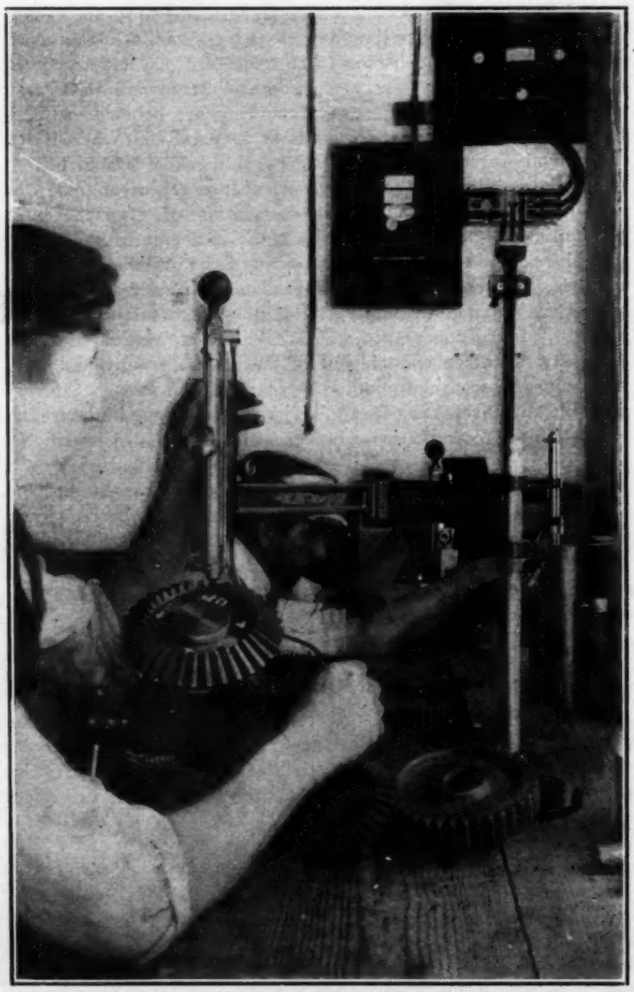


Fig. 2—Testing automobile gear teeth for hardness

pieces that go in an automobile frame have a tendency to slide past each other, from the twists and strains given the car. In thus sliding past each other they have a tendency to shear off the rivets. The leaves of springs do slide back and forth on each other until the center is reached. The central bolt, that holds them together, is liable to be sheared off by this motion continuing past the center. Other parts also have bolts and rivets that are liable to be sheared off. The steels that would be best to withstand this shearing strain could be adapted for use, if samples were first submitted to the shear test. The number of pounds pressure that is required to shear off a given size test bar is given as the result of this test.

Hardness tests are given in several different ways, or rather with several different instruments, each one having an arbitrary scale from which to give the results of the test. The degree of hardness of various metals that enter into an automobile is of importance as this affects all of the mechanical properties, *i. e.*, the tensile strength, elastic limit, contraction, torsion, etc. One hardness-testing instrument drops a ball on the metal and measures the rebound for its result. Such an instrument is shown in Fig. 2, testing the teeth of steel gears in an automobile shop. Another hardness-tester presses a ball into the metal and measures the diameter and depth of the indentation. Such a machine is shown in Fig. 3 and this also records on the dial the number of pounds required to press the ball into the test piece. Another instrument drops a weight on a lead disk placed on the test pieces and measures the amount of its compression.

The degree of hardness of such parts, as gearset gears, is of the greatest importance. These gears must be hard enough to wear well and at the same time tough enough to withstand the strain caused by the clash when they are suddenly thrown into mesh. If too hard the gear teeth will break off and if too soft they will bend out of shape and be useless. All the teeth around the circumference of a gear must be of the same degree of hardness and a testing instrument is very useful for proving this. All moving shafts must likewise have the proper degree of hardness to withstand the frictional wear of the different parts they come in contact with and that move with them. In fact, all of the various metal parts must have a hardness that will best enable them to withstand strains and stresses.

Another test given metals is the bending test, that is, one end is held stationary while the other end is moved enough to bend it around a plug of a given diameter. The number of degrees through which the test piece bends before it is ruptured is given as the result of the bending test. While this may be applicable to some automobile parts, it is seldom used as some of the other tests, heretofore mentioned, are made to take its place.

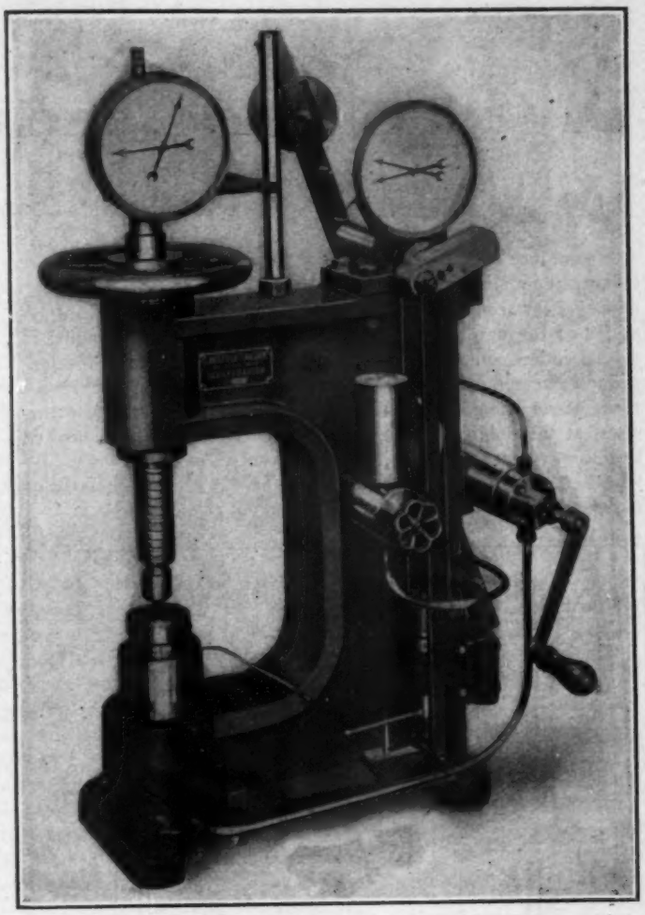


Fig. 3—Indentation hardness-tester

A test is also given to metals to show their frictional wear. The thousandth of an inch that wears off from a given area, in a given space of time, is tabulated as the result of this test. Such a test might be useful to show the life of bearing bushings or the parts that operate in them.

Harking Back a Decade

FROM *The Motor Review*, December 19, 1901:

The United States Circuit Court of Appeals sitting in Boston has affirmed the single-tube tire patent, known as the Tillinghast patent.

In its answer to the suit filed by Richard Siegman, at Trenton, the Electric Storage Battery Co. denies that it has diverted much of the capital stock of the Electric Vehicle Co. into its treasury without adequate compensation. It is explained that 48,000 shares of this stock were used to pay for the controlling interest in the Columbia Automobile Co., which was held by the battery company, but which is now owned by the Electric Vehicle Co.

The Diamond Rubber Co., of Akron, has increased its capital stock to $1,500,000. The company is now 6 years old, starting with a capitalization of $50,000.

The new Century car is of the tonneau type. Its wheelbase is 96 inches and there is no machinery above the floor except in the bonnet. The motor is of four cylinders and is geared to 35 miles an hour.

The retail automobile district of Chicago is steadily moving southward on Michigan avenue. Only recently the Winton, Milwaukee and Waverley have determined to move eight blocks south to Fourteenth street. Several other concerns will probably announce similar action in the near future.

F. B. Stearns & Co., of Cleveland, are busy building a racing-touring tonneau of 22-horsepower. A speed of 45 miles an hour is claimed for the new car. The company does not aim to become a large manufacturer, but is planning some additions to its present plant.

The Long Island Automobile Club held its first annual meeting and banquet last week. W. Wallace Grant was elected president and Frank G. Webb treasurer of the organization.

The British government has instituted a prize competition for a tractor for military purposes and an invitation has been extended to American automobile makers to take part. The first prize is $5,000. The tractor must be able to draw a gross load of 25 tons, 40 miles, at a rate in excess of 3 miles an hour and surmount grades not exceeding 6 per cent.

Digest of the Leading Foreign Papers

New Gear-Probing Methods

With the demand for noiselessness in automobiles and the desire to reduce wear and depreciation to a minimum, designers are turning their attention to suitable devices for testing the correctness of gear teeth curves, either in the shop where the gears are milled or through the facilities of the purchaser. A beginning in this direction, and one apparently susceptible of further development, is described by Moritz Kroll, of Pilsen, Germany, in the form of an apparatus which was first used for instruction purposes at the public trade school in that city. It will be noticed that the grosser inaccuracies due to eccentric mounting of a gear wheel on its shaft or to any curvature of the latter are shown up independently of those due to faults in the tooth curves.

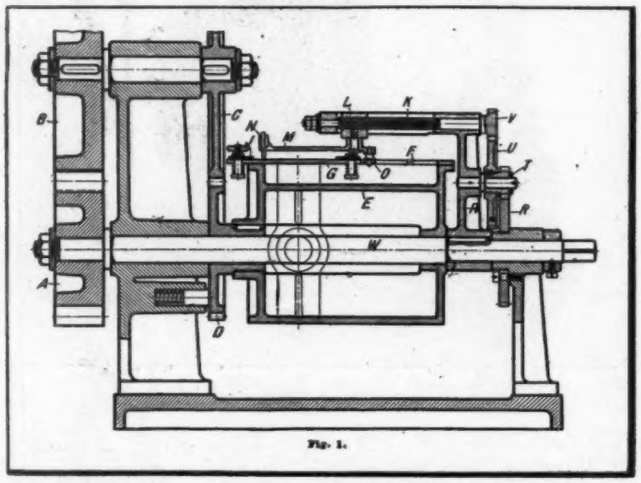


Fig. 1.

Fig. 1—Apparatus designed for testing and charting gear-wheel inaccuracies

Fig. 1 shows the first apparatus designed, which is applicable only to testing gear wheels of a certain size (15 teeth with 1 inch pitch), but whose recording device is sensitive enough for very minute examinations and enables the tester to locate and measure the inaccuracies. Fig. 3 represents a simplified model applicable to gears of different sizes and believed to be sensitive enough for industrial purposes, Fig. 4 represents the same general type adapted to the testing of bevel gears. Fig. 2 represents diagrams produced by the device under varying conditions.

Referring to Fig. 1, the spurwheel to be tested, A, is secured upon the end of shaft W and drives through the spurwheels B, C and D the parts E, D and E being free to rotate on shaft W. The gear ratio is 1. If the mesh between A and B is right, E therefore rotates with the same angular velocity as the arm P which is keyed to shaft W and formed with a horizontal branch K. Every error in the mesh of A results, on the other hand, in an advancement or retardation of the arm P with relation to the part E. A sliding piece L in the branch K carries a lever M whose short arm engages a slot in E while the long arm is provided with a pencil point N which marks a diagram on a strip of paper fastened to the part E. In the test, the shaft W is slowly turned one revolution by means of a crank. A pinion T, mounted upon the arm P together with another larger pinion U, is rotated by its engagement with the fixed pinion R and transmits the movement through the small pinion V to a threaded spindle in K whereby the sliding piece L, with the lever M and its pencil point, is shoved forward while at the same time the pencil point is also actuated by any relative movement between P and E.

The curve I in Fig. 2, which is nearly a straight line, was produced with a correctly milled spurwheel A in a certain relative position of the wheels A, B, C and D. Curve I' was produced by merely bringing other teeth on these wheels into engagement, and a defect in the workmanship of the apparatus was thereby discovered. The shafts upon which A, B and C are mounted had first been turned down, as is generally done, as far as to the collar and had then been reversed in the lathe to turn the reduced ends, but by this operation the latter had become very slightly eccentric, this accounting for the bend in the diagram. By placing the two shafts so that the eccentricity of one neutralized that of the other the diagram I' was obtained. Diagram II was produced from a wheel whose pitch circle was about one-half millimeter too small, while the depth of the teeth was correct for the right diameter.

Diagram III was obtained from a wheel which had been milled with a cutter intended for a wheel with 25 teeth, and diagram IV from a wheel in which three spaces had been specially milled

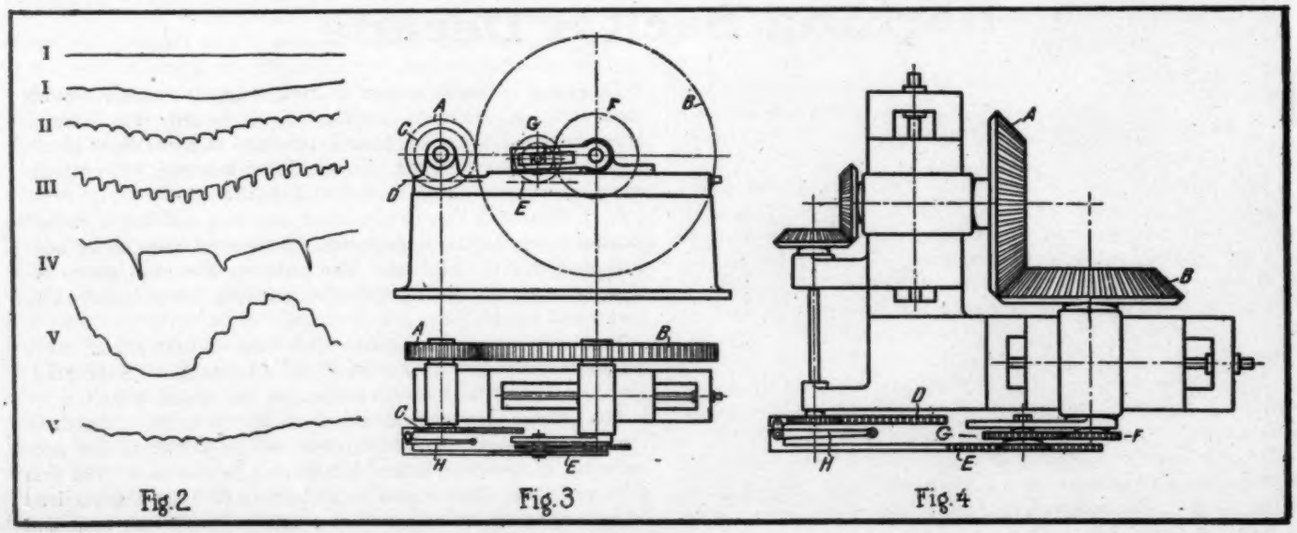


Fig. 2—Diagrams of various gear defects Fig. 3—Sketch of universal spur wheel testing machine, side and plan views. Fig. 4—Sketch of bevel gear and rotary machine, plan view

too deep, so that they were about one-half millimeter broader than the correct ones.

Diagrams V and V' show how strongly an eccentric mounting of a spurwheel on its shaft affects the mesh. The bore of a correct wheel was filed out on one side and wedged eccentrically upon its shaft. The double curvature of the diagram comes from the mesh being too close on one side of the wheel and too open on the other, while the small waves indicate the inaccuracies in the contact of the teeth produced by the misalignment. But when the wedge was inserted on the other side of the shaft diagram V was produced.

In an apparatus adapted for trying spurwheels of varying sizes, as shown diagrammatically in Fig. 3, one of the wheels to be tested, A, is mounted in bearings in the base of the apparatus; the other wheel, B, on a sliding carriage. A is turned a full revolution in the test, and the pinion C, which is mounted on the same shaft with A, thereby pushes a toothed rack D a certain distance, equal to the circumference of C. At the same time another rack E is pushed an equal distance in the same direction through a system of exchangeable pinions F and G, working from the shaft of B. Every fault in the mesh of A with B results in a relative advancement or retardation of the two racks. Rack E carries a bell lever H whose short arm is journaled in rack D, while the long arm carries a pencil point which writes the diagram on a fixed strip of paper.

To get correct readings from an apparatus of this kind it is the supposition that the exchangeable gear wheels, F and G, as well as the racks are properly milled, but if the pitch of these auxiliaries is made quite small, say, 1 to 2 millimeters, even the smallest of them will have a large number of teeth and their faults will show in the diagram curve as very low and short irregularities sharply distinguished from the higher and longer waves which will be produced by errors in the cutting of wheels A and P. The influence of backlash in all the wheels can be counteracted by suitable one-sided loading of the testing movement. The apparatus for testing bevel gears, as sketched in Fig. 4, differs only in having the two wheels A and B mounted on carriages of which one is slidable at right angles in relation to the other.—From *Werkstattstechnik*, November.

Mud Splashing—By a recent court decision in Germany two pedestrians were awarded damages from the driver (owner) of an automobile because the latter, though he had not been driving fast, was held not to have observed due caution to avoid splashing mud upon the two pedestrians on the sidewalk, and the case is exciting much comment in both automobile and anti-automobile circles. In France the same question has been taken up peaceably by the Automobile Club of Seine and Oise which has organized a contest, beginning February 5 next, for makers of anti-splash devices to be attached to or near the hubs of wheels on rainy and muddy days, and which must "not interfere with the esthetic appearance of the vehicles." The regulations for the contest provide that vehicles shall be driven through the mud at 25 to 40 kilometers per hour with the device attached, and as often as the jury of awards may decide to be necessary. The bespattering of the vehicle itself, especially its under surface between the wheels, will also be considered, as well as the time required for attaching the device.

Measuring Efficiency of Gears—Mr. Rikli describes in the *Zeitschrift des Vereines Deutscher Ingenieure* for August 26 an apparatus designed for testing gears under full load without great expenditure of motor power. The device recalls that used by Hopkinson for testing electric motors by grouping them pairwise in opposition. It is shown in Fig. 5. A motor M drives through a clutch K a shaft W1 on which are keyed two pinions r1 and r2. These are in mesh with two gear wheels R1 and R2, of which R1 is keyed to shaft W2, while the other is idle on this shaft and draws with it, by means of a dog, a sleeve with two flange plates T. On the end of shaft W2 there is keyed a plate S1 which drives plate S2 as in one with it, because an irreversible worm, journaled

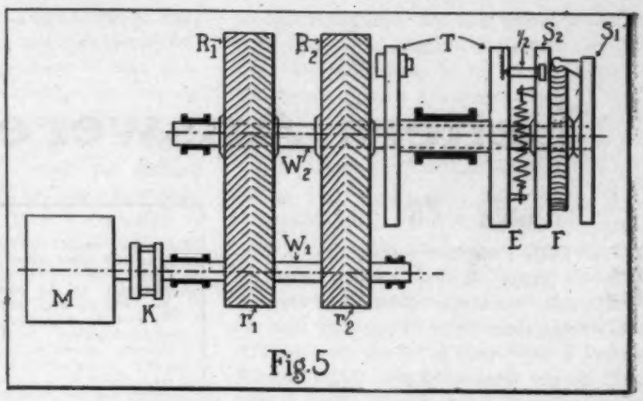


Fig. 5

Fig. 5—Rikli machine for testing efficiency of gears

in S1, is in mesh with the helical gear wheel F secured to S2, and this plate S2 is attached to the adjacent plate of sleeve T by four springs E, which may be stretched to a desired tension by means of the worm.

The tension of the springs E determines the pressure sustained between the teeth of gear wheels R1, R2 and those of pinions r1, r2, and consequently the effort transmitted between these pinions, of which one may be considered the driver and the other the driven. By varying this pressure and the speed of rotation of the machine, it is therefore possible to modify at will the effective work of these pinions and to determine the efficiency of the gear, provided the power required for actuating the two gear wheels, which power is entirely utilized to overcome the friction in the gears and in the bearings, is known. The author tells of a series of tests made with this apparatus which admits of an accuracy which it has heretofore been found impossible to reach, owing to the high efficiency attained in gears and the multiplicity of the losses to be measured.—From *Le Génie Civil*, November 4.

Flame-Welding and Cutting—The oxy-acetylene flame gives a heat of 3,600 degrees Centigrade, the oxy-hydrogen flame 1,900 degrees and the coal gas or gasoline vapor flame fed with oxygen a heat of 1,600 degrees. Those who contemplate the purchase of an oxy-acetylene apparatus for autogenous welding or metal cutting should therefore not permit themselves to be influenced if it is represented to them that the same work may be done with an apparatus operating with hydrogen, gasoline vapor or illuminating gas as with one of the latest improved models of oxy-acetylene plants. A description of suitable acetylene generators and of the most recent British improvements in burners is offered in *Der Praktische Maschinen-Konstrukteur* for October 12.

Permanent Developer—Tourists who prefer to develop their own plates or films will be interested to know that a bath composed of 10 grammes of paraphenylene-diamine, 30 grammes of bisulfide of soda at 35 degrees, 3 grammes of bromate of potassium and 40 cubic centimeters of caustic soda (sodium hydroxide) at 30 degrees, if bottled and protected against atmospheric influence, will keep almost indefinitely. The author has developed plates with a bath which had been prepared for more than one years.—J. Desalme in *Bul. Soc. Francaise de Photographie*, reported in *Revue de Chimie Industrielle*, November.

According to the *Daily Consular and Trade Reports*, the use of motor mail vans is still being extended in England, and over 100 services or sets of services are being performed by this means. Failures and serious delays are now of comparatively rare occurrence under normal conditions, and the greater speed of motor as compared with horse traction is of considerable advantage to the mail service.

Letters Answered and Discussed

Trouble with Patches

EDITOR THE AUTOMOBILE:

[2,958]—I am having considerable trouble in getting patches to stick to the inner tube. I am sure that the cement I am using is of the best quality, yet I do not seem to be able to get results. I would greatly appreciate it if you would give me a few tips on how to manipulate the gum. TYRO.

Clarkesville, Tenn.

The probable cause of your failure in applying the patches is that you do not have the rubber sufficiently clean. This is a point that is very frequently overlooked by amateurs. A piece of sandpaper should be used as in Fig. 1. When assiduously

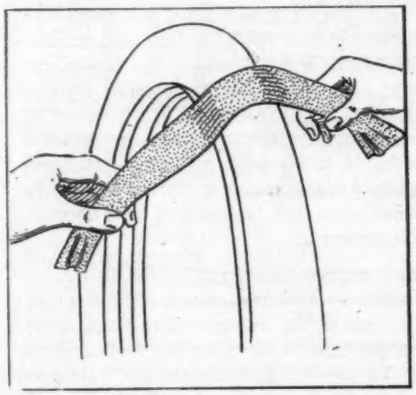


Fig. 1—Method of cleaning a tire with sandpaper

applied this will remove any excess dirt from the rubber and greatly assist the work of repairing. If the patch is not applied until the rubber cement is nearly dry it will often hold better.

Has Crankcase Explosions

Editor THE AUTOMOBILE:

[2,959]—Being a constant reader of your publication I take the liberty to ask for a little information concerning the oiling system of my car.

This motor has a filler on the right side of the crankcase and a large breather on the left. Now very frequently there is a light explosion in the crankcase, which one would judge at first to be crankcase compression, but on account of so much smoke and the odor of same I now think this an explosion of gas. About one-half the time this explosion will pass out through the breather, the other half through the filler, taking with it about one-half pint of oil. I put the blame on the oil at first, but have

The Editor invites subscribers to communicate their automobile troubles and personal experiences, stating them clearly on one side of the paper. If the nature of the case permits, send a sketch, even if it be rough, in order to assist to a clearer understanding. Each communication will receive attention in the order of its receipt, if the writer's signature and address accompany it as an evidence of good faith. If the writer objects to the publication of his name, he may add a nom de plume.

tried the very best grades of oil on the market and it is the same old story. This motor has a constant level splash system and the overflows from the crankcase to the oil pan below are open, so, of course, the amount of oil in the pan, unless it was too full, would make no difference. The breather is open for one time it will relieve the pressure and again it won't. The condition of the road makes no difference, for this explosion occurs while going fast or slow, on level ground or up and down hill.

I will appreciate any information THE AUTOMOBILE can give me, and would like to hear from some of the readers who have had similar troubles. OWEN.

Minden, La.

The gas probably leaks past the piston rings on the compression stroke and accumulates in the crankcase where it is finally fired. This crankcase explosion will only occur in case the piston rings are so badly worn that the flame from the burning charge will flash past the bottom of the piston and ignite the inflammable gases which have accumulated within the crankcase after a series of compression strokes have allowed a sufficient amount of gas to leak down into the crankcase. There is also a probability that the breather pipe has not been kept as free as it should be on account of the screen having become choked with accumulated dirt. By removing this dirt and renewing the piston rings. There is also a possibility that there is a blow-hole in the top of the piston casting which allows the gas to penetrate the crankcase, or a very slight possibility that the cylinders are scored deeply. A good method of ascertaining if the cause of the trouble comes from any of these sources is to test the motors for compression.

Renewing Clutch Leather

Editor THE AUTOMOBILE:

[2,960]—I have a car on which the clutch leather facing is worn and which I desire to renew. Would you kindly tell me the kind of leather to use and the method of applying the same to the clutch member?

Mechanicsburg, Ohio. E. R. S.

When removing the rivets from the old leather care should be taken not to tear the leather so that it may be used as a template in cutting the new leather. This should be cut from the thickest part of the hide. The old facing is laid over the new and the position of the rivet holes located thereon by marking through the old holes with a pencil. The rivet holes are then cut and countersunk so that the rivets will be well below the surface of the leather. The rough side is turned out. The fitting has to be very carefully done and a superior job is made if it is trued up in a lathe. It should then be soaked in castor oil and will be found to apply itself to the female member of the clutch.

Wants Valve Information

Editor THE AUTOMOBILE:

[2,961]—I have several times read that there should be no lost motion in the valve action. All the advice I received through the reading of various books and publications led to my investigating the valve rods on my car and after a large amount of trouble I located some clearance space between the tappet and push rods. I was just about to adjust the rods so that there would not even be this small amount of space when I was told by a man whom I know to be somewhat of an authority on the subject that I should leave the clearance as it was since the rods expanded when the motor was running owing to the heat. Now

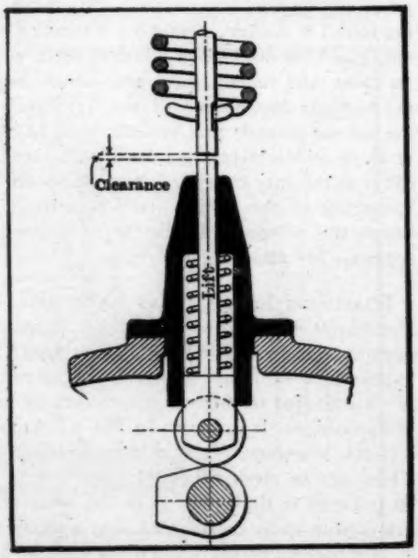


Fig. 2—Valve tappet having no provision for adjustment of clearance

I am all at sea on the subject and wish that you would clear up the mystery for me. M. BEPPO.

Allentown, Pa.

The mystery is readily explained since both parties gave you the correct advice. Since the clearance which should be left at the point shown in Fig. 2 will close up after the engine has become warm, there will be no lost motion at this point. This will be the case whether there is an adjusting device on the stem or not. On all cars built within the last few years, however, this device will be found. The adjusting device is shown in Fig. 3 and should be tightened up so that there will be just sufficient clearance at the point designated, that a visiting card may be inserted between the two members of the rod.

Belittles New Motor

Editor THE AUTOMOBILE:

[2,962]—In THE AUTOMOBILE of November 12, appeared an article entitled Tesla's New Mechanical Principle. To anyone interested in the description of the new motor, which is to give such high thermal efficiency, I should like to suggest the reading of an article designated Bladeless Turbines printed in *Engineering*, London, dated November 10.

The article deals with Tesla's motor from an engineering standpoint and, in my opinion, shows the fallacy of the principle used. M. H. W.

Chicago, Ill.

The article referred to contains a criticism of new experiences on a basis of old-approved formulæ, proving the impossibility of constructing a motor as the one in question.

We remember a certain Robert Fulton, who steamed up the Hudson, even while his act of doing so was pronounced an impossibility by his fellow-citizens, as well as the example of one Knight, whose construction was scoffed at and considered impossible at the very moment it was propelling an automobile through the streets of Chicago.

These examples, with a score of others in history, show that formulæ are nothing eternal and unalterable, but that they hold good quite as long as they are applied to the conditions they were made for, and that, when new experiences come up, it is the formulæ that have to be adapted to facts and not *vice versa*.

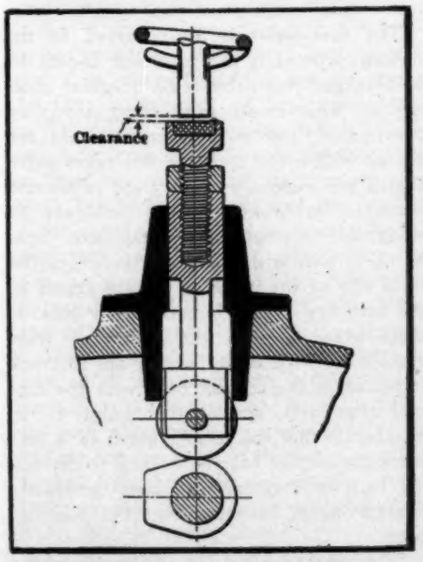


Fig. 3—Tappet of better design, showing adjusting device

Interested in Self-Starters

Editor THE AUTOMOBILE:

[2,963]—I notice some self-starters that are being shown in the journals which obtain a sufficient charge of gas from the acetylene tank by the suction of the engine on the opening of the gas line after cutting out the ignition, which it is claimed will start the motor after standing several hours by merely turning on the switch.

Will you kindly explain in the letter columns of THE AUTOMOBILE how this is accomplished and why the acetylene will do this when the gas from the carbureter will not. Do you think that starting the motor in this manner would strain it in any way?

Newcastle, Pa. J. H.

There are no self-starters using acetylene which rely on the suction of the motor to draw in a charge and then start on the spark in the manner you describe. The acetylene self-starters either allow the gas to flow into the cylinders under pressure or the gas is forced in by means of a small hand pump. Self-starters are not made with the idea of starting the motor after it has been at rest a few hours, but are intended for the purpose of starting at any time.

Front Tires Wear

Editor THE AUTOMOBILE:

[2,965]—One of the strange features about my tire troubles, of which I feel that I have had more than my share, is the fact that the front tires wear out much more rapidly than do those attached to the driving wheels of the car. I do not know how to account for it exactly as the tires on the front wheels seem to be worn on the outside more than on the inside. I would greatly appreciate it if you could tell me through the columns of THE AUTOMOBILE what the causes of this trouble could be.

Cornwall, N. Y. EDWARD BRONSVELD.

It is very evident that the front wheels are out of alignment. This may be readily determined by the method shown in Fig. 4. A tape measure is used to find the distance between the two inner edges of the rims of the front wheels. The wheels are then turned to different positions and the distance measured at the same height above the ground in every case. A rather ingenious method, but one which is not so accurate, is to apply whitewash to the tires and spin them to see if the lines of whitewash thrown off are parallel.

Loss of Compression

Editor THE AUTOMOBILE:

[2,964]—I have a car in which the motor does not develop the power it should, due to one of the cylinders losing compression past the piston rings into the crankcase. I put on some new rings but it did not seem to do any good, when I put on the new rings I noticed parts of the rings were worn bright and other parts had dark places on them. Will you please tell me the best and proper way to overcome this leakage. F. A. NELSON.

Rupert, Idaho.

The correct method to use in such a case is to have the cylinders rebored. They are evidently worn irregularly if the piston rings are not bright on all sides and you are losing compression. This will have to be done by a reliable concern or the motor will be hopelessly ruined should the work be carelessly done. The factory would be the best place if it is not too far away from you.

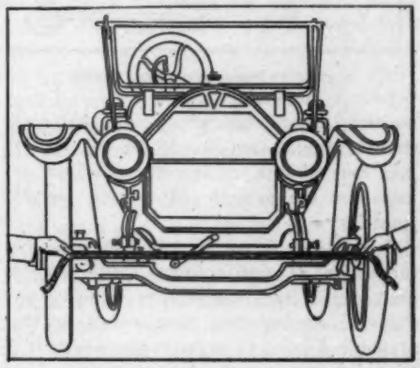


Fig. 4—Showing method of aligning front wheels

A Worthy Cause

Editor THE AUTOMOBILE:

[2,966]—Will you kindly allow a little space in the pages of THE AUTOMOBILE for the following few lines: I am a teacher of foreign languages in the Benjamin school, 144 Riverside Drive, New York City, and in my spare time I am endeavoring to do philanthropic work. The Cherry Tree Home for Children in Spring Valley, N. Y., needs very badly a vehicle that would serve to carry the children.

The manager of the school, Major Erberich, asked me to see what could be done for the purpose. They are willing to give a small sum for it, but we thought that at this season of the year there might be someone who would donate a new, or even an out-of-date automobile for such a worthy cause.

New York City. ANNA DIEHL.

Little Bits of Motor Wisdom

Pertinent Pointers of Interest to Repairman and Driver

SOLDERING FOR AMATEURS—Hundreds of burnt fingers and other proofs of an active interest in the art of soldering on the part of tyros go to prove that this apparently simple operation has its difficulties and puzzling features. Solder is the metallic parallel of the glue used in connection with woodwork and other work in which this fluid plays the part of a connecting agent. To define solder is impossible, as there are

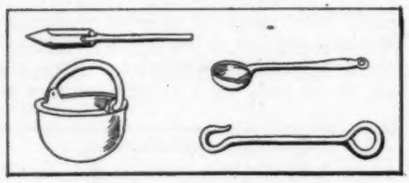


Fig. 1—Tools used in soldering

so many compounds which bear that name that a lengthy list would be required to mention all the compositions which are used for the purpose of making metallic joints.

Common features in all solders is that they have, as a rule, lower melting points than the metals which they connect and they are weaker than most metals, so that a soldered joint is never made where it is required that the joint be particularly strong. If strength is required, the joints are either brazed or welded. These, of course, are more costly operations than soldering, but are of much greater strength. In many of the welding operations the joint is stronger after it is made than the metal itself.

The correct solder to use varies with each metal so that it is impossible to describe soldering in general, although the necessary steps which are common to all work of this nature may be mentioned by way, perhaps, of explaining the cause of a possible failure where the correct solder has been used for a certain piece of work, and yet where that work has proved other than a success. The first point to be observed is that the metal must be scrupulously clean. The metals are then heated to a point where they will unite with the solder in making the joint and covered with a flux so that the surfaces will be maintained absolutely clean. The solder is then applied with a soldering bit and the metal joined together. The joint is then cleaned and finished and allowed to thoroughly cool. The flux may be applied to the metal before it is heated if it is of borax or resin solution, but if it is a liquid it is better to heat the metal and then apply the flux.

The cleaning is accomplished by means of a rag which will remove all grease and leave the metal about to be joined perfectly dry and free from grease. A scraper and file are then called into requisition and the parts to be joined are made bright. The effect of the flux which is applied is to eat away the film of oxide which accumulates on the surface of the metal.

The solder, which is in general a lead and tin combination of various proportions, is then melted on the hot metal by means of a gasoline torch, Fig. 4 or in the case of smaller work this is often done by means of a candle. Where a soldering bit is used, this is heated to a low red heat and then pressed against the solder, causing it to run over the surface of the metal. The metals must not be too hot as they will then tend to oxidize in spite of the flux or will make the solder too fluid. Soft solder, which is used in the majority of small jobs, consists of 1 part lead to 2 parts tin. The flux used will vary with the metal to be joined. Zinc chloride is used with lead, zinc, copper, etc. Aluminum should be welded.

TEMPERING OF TOOLS—The subject of the hardening of metals of many different sorts has been of interest to humanity as far back as we have any record in history. The old art of tempering certain forms of metal has been lost to some extent although marked improvements have been made in this direction in the past few decades.

All those who do any extended work with tools should know how to temper them, as it will be found that the necessity for so doing will often occur. This is especially so in the case of a garage where the work done is in most cases upon hard metals and with tools which require frequent grinding. Skill in the art of tempering can only result from experience, as personal judgment is the most important factor in connection with the work. Tempering processes require a rather more complicated apparatus than that usually made use of in the ordinary operations of forging. Care has to be taken in the tempering process that unequal cooling or heating shall not occur; for if it should, the internal strains in the metal caused by the unequal expansion or contraction of different parts of the same piece of metal will cause a break in the metal.

There is no satisfactory explanation as to the reason that the metal assumes different shades of color as it reaches different degrees of hardness nor why a sudden change of temperature should harden the metal. It is only known to be a fact and although several theories have been advanced which seemed to fit a large number of the phenomena, there are other points which still remain unexplained. It is for this reason that absolute directions as to how to go about tempering a certain piece of metal cannot be given. Experimenting is the only possible way to obtain definite knowledge, although a few of the salient points may be pointed out which will act as a guide to those who are interested in this form of work.

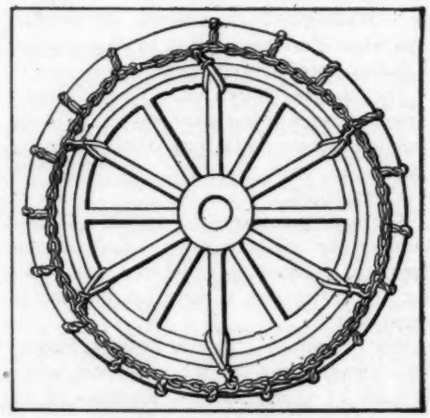


Fig. 2—Wrong way to apply chains

The first point to be observed in the cooling process is that the bath should be so arranged that there is no irregular cooling or, what is the same thing, irregular contraction, for such severe stresses are set up within the metal if this takes place that it will generally be very apt to become distorted or broken. Most tools are of wedge-like formation, so that care must be taken that when they are immersed the thick end of the wedge is always placed in the bath first. This is particularly true of tools which are in the nature of wide chisels. A wide chisel is very apt to crack if placed in the cooling bath with the cutting edge first, and another point to remember is that the temper given to a tool when the cutting edge is the first to go into the bath is irregular, the metal gradually diminishing in hardness from the point or edge.

It is almost useless for any novice in the art of tempering to pick up a book on the subject and read the explicit directions

which are often given regarding the color which the metal is allowed to attain before it is plunged into the cooling bath. This is a thing which will have to be seen more than once before the tyro in the art will be able to accurately gauge the delicate shades which fade into one another so smoothly and withal so rapidly. When steel which has been raised to a red heat is plunged into cold water it becomes excessively hard and brittle; the more suddenly the heat is abstracted from the metal the harder and more brittle will it become; but in order that it shall have qualifications necessary to be of any use it must be tough. This toughness is given to the steel by a process of tempering. In order to produce steel which will have this quality to a necessary degree the metal is reheated and when the film of oxidation, which changes color with the variations in temperature, reaches the desired shade, the metal is cooled quickly and regularly by immersion in the bath most suited to the requirements of the temperature at which the part is to be chilled.

In ordinary mechanics' tools the tempering process is carried on by first heating the metal to a bright red heat whereupon it is plunged rapidly into the water and then withdrawn. A scale will form on the outside of the metal which is immediately scraped off. As the surface only has been cooled by the short immersion which has been given the tool the interior of the metal will still be at practically the same temperature that it was before the tool was plunged into the bath. Owing to the conductivity of the metal the outer crust of the metal will be gradually reheated by the interior and will acquire various tints which correspond to different temperatures. When the shade is reached that has been determined by experience to be the best for the work in hand, the metal is plunged into the bath and rapidly stirred about so that the cooling will be equal throughout the entire piece.

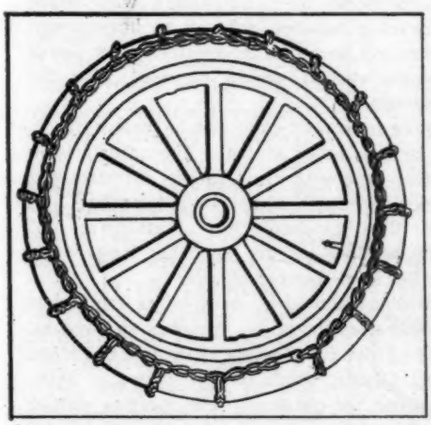


Fig. 3—Right way to apply chains

In small tools, which are so thin that the interior is cooled at the same time as the exterior when plunged into the water, a hot plate is brought into requisition for the purpose of reheating the metal to the required shade.

There are several ways of heating steel parts to bring them to the required temperature for quenching, as the first plunge into the bath is called. They may be heated over an open fire, heated upon a hot plate, on a pan over a charcoal fire or, in the case of small articles, by placing them in oil which has been raised to the correct temperature or in a molten alloy. The principal thing to remember, however, regardless of how the piece is heated, is that before quenching the temperature of the metal should not be excessive. In the better grades of steel a low cherry red will suffice. A gauge as to the hardness of the metal after it is dipped may be readily obtained by trying it with a file. On the other hand, if the steel is not properly hardened it cannot be satisfactorily tempered. Cold chisels and iron-cutting tools are chilled at a temperature of about 490 degrees Fahrenheit, which corresponds to a very dark straw yellow color.

Non-Skid Chains Tear Tires—It may be well said that non-skid tires are to a great degree more of a necessary evil than a delight to those who are compelled to use them. It should always be remembered that when these tire chains are fitted they should not be confined so that the links in the chain are continually over the same spot but they should be allowed to creep along the surface of the tire. If any one of the links in the chain is continually pressed against the same spot in the casing of the tire it will gradually imprint itself into the rubber.

It is very easy to see what the effect would be if the chain had sunk into the rubber for any distance and the car were to swerve suddenly. A tearing effect would be produced which would be very apt to result disastrously to the casing eventually. Chains should never be fastened to the spokes of the wheel, as is often done. This is the surest way to invite rapid wear.

Another point to remember in the application of chains is that they are not intended for use on city streets where the hard pavements will greatly augment the wear that the chains are inclined to cause. The chains find their best field of use in the soft mud of the country roads, where they are admittedly a necessity and where they are not backed up by a hard under surface which presses them into the tire casings. The greatest injury will result to tires when they are used on asphalt or similar roads.

Underinflation a Cause of Trouble—The evils of underinflation have been dwelt upon to such an extent in late years that there are few who have not heard a detailed account of the results of this form of neglect. Still, it might not be amiss to point out some of the more serious results of underinflation which have been the experience of those who have had the opportunity to see these results demonstrated in a practical way.

After a period of running while soft the tire will start to take on a baggy and out-of-shape appearance which will first demonstrate itself in the looseness of the tread. If the abuse is continued the looseness will become aggravated until it finally reaches such an advanced stage that the tire casing will be found, upon examination, to be distorted in a series of parallel ridges which run across the face of the tread. This wavy condition cannot be cured when it is once started, and a tire that has attained this shape is well on its way toward the scrap heap.

This particular case of tire trouble is one which strongly brings forth the old adage concerning the ounce of prevention, as a few extra strokes on the tire pump are all that is necessary to safely avoid any injury of this nature. The small cost of a tire gauge is well repaid by the good it can do in this direction, for by noting the pressure and following the directions of a reliable inflation table it will be found that this trouble is never experienced. Besides the ill effects on tires, the rims are damaged by underinflation, as whenever the car passes over even a slight ridge, the rims are apt to be cut by impact with stones or ruts.

When the car is turning a corner and the tires are not sufficiently inflated the bead will lift from the rim and pinch the tube between the bead and the rim. The result will be that the tube is cut and a blowout occurs. Before attempting to replace the outer bead in the rim-casing the tube should be slightly inflated and the hand passed inside the casing to make sure that the tube is not twisted or caught under the security-bolts as this would also cut the tube.

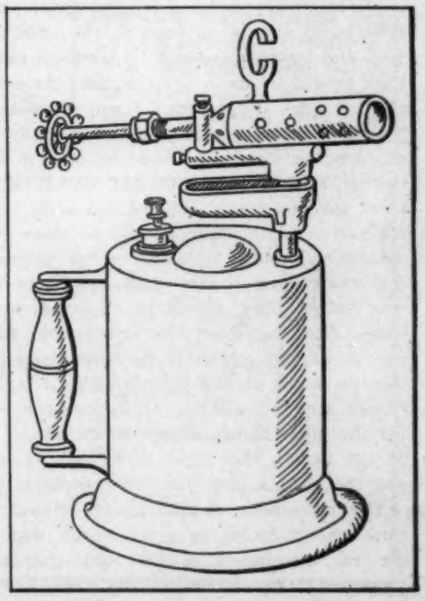


Fig 4—Gasoline torch for soldering

My Ideal 1912 Automobile

Readers' Conceptions of What Next Year's Car Should Be

Readers continue to demonstrate their interest in the ideal car and the specifications which are submitted show a wide range of taste and requirements. In view of the interest shown the Editor continues to extend the invitation to all who entertain ideas on this absorbing topic to submit their opinions for publication. The description should be legibly written on one side of the paper and signed by the sender, although if it is so desired the name will not be published.

Features Accessibility

EDITOR THE AUTOMOBILE:

My ideal car for 1912 should be built as follows: The motor should be a T-head type with long stroke. There should be six cylinders cast in pairs with dimensions of 4 1-4 inches by 5 1-2 inches, and the maximum speed should be 1,800 revolutions per minute. The 2 1-2-inch valves should be covered with easily-removable protectors. The crankshaft should have five ball-bearings and it should be offset 1-2 inch. The pistons should be removable from below.

The motor, clutch and transmission should be built as a unit and suspended on three points by the top half of the crankcase which should be made of bronze. A Bosch magneto should be on the left or exhaust side of the motor, and a hard rubber bar should be used to simplify the wiring for both magneto and battery plugs which should be over the intake valves. A large centrifugal pump should be placed on the right side of the motor with large connections leading to the cylinders and the honeycomb radiator. The radiator cooling should be augmented by a gear-driven fan placed slightly toward the exhaust side of the motor. There should be an automatic oiling system, and the oil should be pumped through the hollow crankshaft and up the connecting rods to the wristpins, with a reservoir in the crankcase allowing splash for the camshaft and the main crankshaft bearings. Special arrangements should be made for cleaning, replenishing and taking care of the system.

The clutch should be of the multiple disc type, having 61 plates running in oil, and with automatic adjustment. The plates should be made of bronze and steel. A four-speed transmission with direct drive on the fourth speed has proven satisfactory. Special attention should be paid to the accessibility for the examination of the clutch and transmission. Straight-line drive should be used when the car is loaded, and there should be two universal joints inclosed in dust-proof aluminum casings. The differential should be floating, the case being made of pressed steel and strongly trussed. Adjustable radius rods and a torsion tube should be used to strengthen the construction. A trussed channel-steel, drop-forged frame should be employed, together with an I-beam axle in front having a tie-rod behind and above it. Annular bearings should be used in all wheels, and also in the differential, transmission, clutch and clutch-thrust. The front springs should be long and wide, of the semi-elliptic type, while the rear springs should be three-quarter elliptic. Shock absorbers should be used on all springs. Large expanding and contracting brakes with equalizers should be put on the rear hubs. They should be 18 inches in diameter by 3 inches wide. Steering should be irreversible with simple adjustment, and should be accessible for oiling and inspection. Spark and throttle levers should be located on a 20-inch corrugated, hard-rubber steering wheel. An accelerator and a common control for the other levers should be included. The wheelbase should be 135 inches, the tread 56 inches, the clearance 11 3-4 inches and the body a four- or five-passenger torpedo.

The equipment should be as follows: Booth demountable rims, size 36 inches by 4 1-2 inches, with two extras carried in the rear, a 30-gallon gasoline tank, also carried in the rear, with pressure gauge carried on the dash, a 2-gallon extra oil tank, top side curtains, banker windshield of the rain-vision type, nickel and black trimmings, Gray and Davis electric lights, Klaxon horn, Warner speedometer and clock, gasoline gauge, tire irons, four-cylinder tire pump, complete set of tires, tire tools, robe rail, Disco self-starter and a gradometer.

Too great emphasis cannot be laid on accessibility. Every nut and bolt should be removable with an ordinary wrench.

This car should weigh about 3,000 pounds when filled with gas, oil and water. The cost should not be over $3,000.

Greeley, Colorado. NELSON REYNOLDS.

Emergency Foot Brake

Editor THE AUTOMOBILE:

This is my ideal car for 1912. The motor should have four cylinders and should be of the monoblock type. The size of the cylinders should be 3 1-2 inches by 7 1-2 inches, with which dimensions it should develop between 20 and 30 horsepower. This would be plenty for any part of the country. The Bosch high-tension, dual magneto system should be used, also the force-feed lubricating system.

The car should be equipped with a cone clutch, leather faced, which is far superior to any other clutch. The transmission should be of the selective type with four speeds forward and reverse. The gear ratio on fourth speed should be one and one-half or two to one. The car should have shaft drive, and the front springs should be semi-elliptic, 50 inches long, while the back springs should be three-quarter elliptic.

The length of the wheelbase should be specified as 130 inches and both the front and rear tires should be 36 inches by 4 inches. The rear axle should be of the full-floating type, and the front one should be a B. & L. Castor, which in my opinion is safer and easier on the driver than the old kind. The steering should be done through an 18-inch steering wheel with spark and throttle levers on the top.

For the control, there should be two pedals and one gear-change lever. The left pedal should operate the clutch and service brake, one-third downward movement releasing the clutch and further movement applying the service brake. The right pedal should operate the emergency brake.

An electric generator, such as is used on the Cadillac, should be used for lighting and starting the motor. The rest of the equipment should be standard. The body for the car should be of the fore-door type.

This car could be manufactured for $1,250 or $1,500, according to the type of body wanted.

Saylorsburg, Pa. ROBERT L. SNYDER.

Wants No Muffler Cut-Out

Editor THE AUTOMOBILE:

I think it might be a pertinent suggestion in connection with the discussion of car improvements now going on in the columns of THE AUTOOBILE that the muffler cut-out should be omitted, because when it is fitted, it is sure to be used and this goes a long way toward making the car a nuisance on account of the abuse to which this attachment is often put by the thoughtless. P. CARR.

Schenectady, N. Y.

New Ideas Sketched in Berlin

Fancy Seats for German Cars—Other Novelties Noted There

At the recent automobile exhibition in Berlin the Wilkening floating seat *(Schwebesitz)* attracted considerable attention. As compared with the seats usually fitted to automobiles it is supposed to represent a refinement in the way of comfort and at the same time a saving in weight and space, and perhaps in economy. It is an elaboration of a style of easy chair which years ago was much in use in Europe, generally in the form of a rocker, but its comfort in the cruder form was not considered unsurpassed. The illustration (Fig. 1) shows the present construction (German patent 221,922). The two triple leaf springs A on each side of a seat are joined at the top by a transverse bolt C around which the roller sleeve D turns on ball-bearings. At their front ends the springs carry, on flattened and slotted portions B, the cross board E, whose position may be adjusted about 3 1-2 inches by means of thumbscrews F and to which are secured the series of springs G. These are upholstered, and the woven material H is secured around them and passed slack over the roller D, the edge being stiffened with a rod I to the ends of which are attached eyelets K hooked to coiled springs L. The lower ends of these springs are attached to the scrolled upper ends of the base leaf in each of the springs A, and their strength may be chosen to suit the weight of the person occupying the seat, particularly on the occasion of long-continued journeying. To obtain the maximum of comfort the material H should be hung very slack and the hollow formed should be filled with an upholstered cushion M. A thin horsehair cushion for the back N is also advisable.

When to be used where it is desirable to save space if a seat is not engaged, the springs A are made with a joint which admits of the seat being folded up. For the same purpose the usual manner of mounting the seat is by means of tubular rails on which the seat may be slid forward or backward, as indicated in the illustration. The most important space economy is secured through the fact that the back of the seat has no appreciable thickness, so that the knees of a passenger in a rear seat, in the case of a car with six or seven seats, can extend forward between the springs A of the seat in front of him.—From *Zeitschrift des Mitteleuropaischen Motorwagen Vereins.*

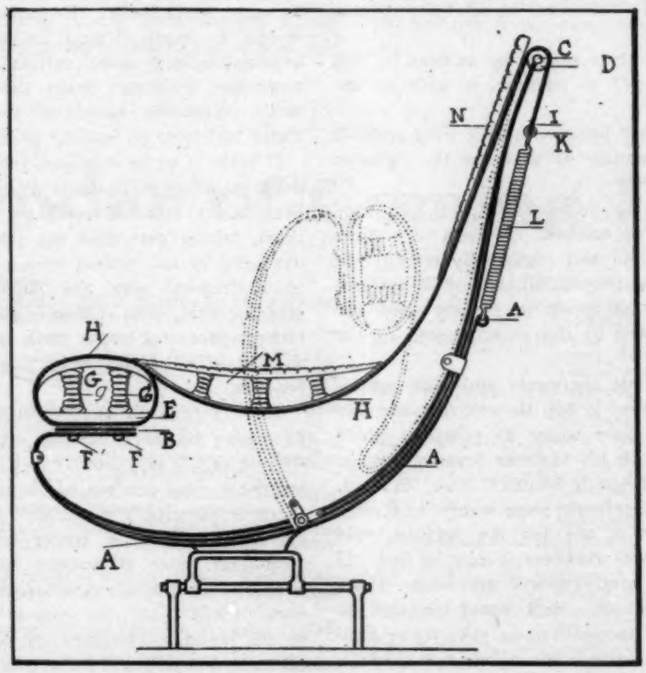


Fig. 1—German novelty in automobile seats

In the 40-60-horsepower Renault car shown at Berlin a small hinged cover gives very convenient access to the universal-joint on the drive shaft for purposes of inspection and lubrication, as shown in Fig. 2, and immediately in front of this cover a small differential gear is placed inside of the universal-joint housing, forming a part of the cross shaft from which the rear wheel brakes are actuated.

It is not necessary to remove the main cover plate on top of the gear box in the 13-30-horsepower Lorraine-Dietrich car in order to replenish its supply of grease. A small cap secured with an easily undone bayonet joint, as shown in Fig. 3, can be removed for this purpose, when only one of the footboards is raised.

The water pump and the ventilator fan work on the same shaft, both driven by gear from the camshaft, in the 17-40-horsepower Dixi car, as shown in Fig. 4, and the pump can be removed by undoing a few screwbolts. The fan has only two blades, in aeroplane propellers.—From *Automobilwelt*, November 22.

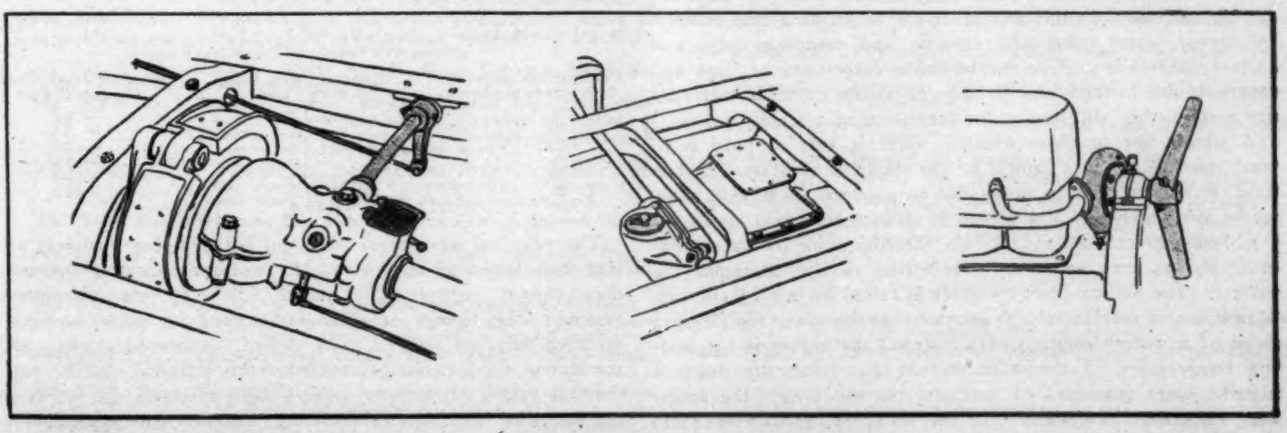


Fig. 2—Hinged cover on Renault universal joint

Fig. 3—Cover plate on Lorraine-Dietrich gear box

Fig. 4—Two-blade of Dixi car

Keeping Cooling Water from Freezing

AMONG the apparent paradoxes of automobiling the use of anti-freezing solutions holds a prominent place. The same motorist who is troubled in summer by the problem of cooling his water to a sufficient degree, so as to relieve the cylinder walls of the surplus heat which cannot be utilized, is faced in winter by the alternative of either using a specially mixed cooling solution or run the risk that the cooling water should grow too cold to be of use. But there is really no paradox at all. In either case the proposition is to keep up the flow of a liquid cooling medium through the cylinder jackets and to remove by means of the liquid just enough heat to keep the walls at the most advantageous temperature.

To prevent the freezing of the cooling water, a number of chemicals have been proposed to be mixed with the water. The prescriptions recommended and used are of varying value, and their worth is determined by three conditions:

1. The freezing point of the mixture should be low enough to insure the liquid remaining in that state at all temperatures encountered in a given climate.

2. The boiling point of the mixture should be as near to that of water (212 degrees Fahrenheit) as possible, to give an approximately equal cooling effect.

3. The use of the mixture should bring about the least possible chance of incrustation or formation of scale in the cylinder jackets.

As to the various anti-freezing solutions known and used at this time, they are chloride of calcium, chloride of sodium (salt), denatured alcohol, glycerine and sugar. By considering each of these materials as to how they fulfill the conditions outlined above little difficulty will be found in settling upon the anti-freezing solution best adapted to the requirements of the motorist.

Before considering these various chemicals and their effects upon the cooling-water of an engine it will be well to remember that the principle of using as pure water as possible, which every autoist strictly adheres to in his summer practice, should not be violated to any large extent in winter. Now, in summer everybody is eager to use perfectly pure water, and since distilled water is too expensive to use for the purpose, rain water is in great demand and used wherever it may be had. If this is not the case, a cautious motorist will use water which has been boiled and thus made soft. Soft water contains no calcium and magnesium salts in suspension, as rain water contains only what it had a chance to dissolve on its fall through the air, *i. e.*, a trace of carbon dioxide, and by boiling water the calcium and magnesium bicarbonates contained in it become insoluble and settle at the bottom of the vessel as a fine powder. Whenever water containing calcium and magnesia salts and carbon dioxide is boiled, the insoluble carbonates of lime and magnesia are formed, and if large quantities of these materials are present, they will lead to the formation of a scale.

A simple test to show whether water is soft or hard is to wash one's hands in a sample of the water in question. If it is hard, it will be next to impossible to produce foam with soap, while soft water will give plenty of clean foam.

Chloride of calcium reduces the freezing point of water considerably, as may be seen by referring to the accompanying table 1. The boiling point of water is raised by mixing chloride with it, and it may be said, in general, that the lower the freezing point of a watery solution of a material the higher is the boiling temperature of the solution. In dissolving the material absorbs large quantities of heat and thereby lowers the freezing temperature of water. If the water is transformed into steam, the salt dissolved in it is again transformed to the solid state and, giving off thereby the amount of heat formerly absorbed, raises the boiling point of the water correspondingly. Thus the cylinder walls are permitted to reach a much higher temperature before the water is evaporated, and while such a temperature, if it is kept up, reduces engine efficiency, a good radiator will keep the water from evaporating to a perceptible degree. Chloride of calcium will not corrode the cylinder nor jacket walls, unless it reacts acidic, in which case its solution reddens blue litmus paper. But, like most other salts, chloride will do harm to the radiator by acting as an electrolyte and gradually dissolving portions of the solder elements. Although the general belief is in opposition to the statement, the fact is that calcium chloride causes a formation of scale in the jackets, if it is used for some time. The reason therefor is the small carbon dioxide content of the water, which brings about the formation of carbonate of lime. Even if pure water is used to make the solution, the carbon dioxide will find its way into it and be dissolved by it in course of time. It is not so very improbable that some carbon dioxide, which has a very fine molecular structure, leaks through the pores of the cylinder walls, by-and-by enriching the carbonic-acid content of the water and later on leading to scale formation.

If scale is to be removed from the jacket spaces, this may be done by either mechanical or chemical means. In the first case, the jackets are taken off the cylinder, and scale scraped off them, taking care that the jacket and cylinder walls are not damaged by too violent blows. If the scale is to be gotten off in a chemical way, the jackets should be filled with dilute muriatic acid. But if this is done the acid should be left in the jacket spaces no longer than is necessary to dissolve the scale, as corrosion of the metal surfaces will be the result of this practice.

Scale formation is prevented by the use of common salt (sodium chloride) instead of the calcium compound. The sodium salt is very similar in its behavior to the calcium chloride, but the normal product of the market never reacts acidic, so that there is practically no chance of its corroding the jacket surfaces. Nor will it under any circumstances lead to scale formation, since all sodium salts are soluble in water. Even if the water should evaporate and the salt be deposited in a solid form, it will dissolve as soon as water is again admitted to it. As to its freezing efficiency, it is not quite as good as calcium chloride, but will serve almost as well and fill every need despite the inclemencies of winter in any locality of the temperate zones.

TABLE 1.—FREEZING TEMPERATURES OF CALCIUM AND SODIUM CHLORIDE SOLUTIONS OF VARIOUS CONCENTRATIONS

Contents of Compound in Water in per Cent.	Freezing Temp. Cent. Sodium Chlor.	Freezing Temp. Cent. Calcium Chlor.
5	— 3.8	— 2.5
10	— 7.4	— 5.6
12	— 8.9	— 7.0
15	—11.0	— 9.6
20	—14.4	—14.8
25	—17.7	—22.1
30	—20.4	

The principal advantages of liquid anti-freezing mediums are that they leave no residues if the water evaporates, and that they cannot corrode any metal parts of the circulation system. The virtues of alcohol dissolved in water for anti-freezing purposes are not to be denied. Denatured alcohol, and sometimes wood alcohol, is used for this purpose and the anti-thermal values of various water-alcohol mixtures are given in the following table, the values being, however, only approximate.

TABLE 2.—FREEZING POINTS OF ALCOHOL-WATER SOLUTIONS OF VARIOUS CONCENTRATIONS

Quarts of Alcohol per Gal. Water	Alcohol Content in per Cent.	Freezing Temp. Deg. Fahren.
1	20	10
1½	30	— 5
2½	40	—20
4	50	—35

The trouble with alcohol is that it evaporates more rapidly than water, so that after running the motor on an alcohol-water cooling solution for some weeks, unless the radiator is perfectly tight, most of the alcohol will have disappeared. To make sure that the qualities of the alcohol still warrant its use, it should be tested for its density from time to time. Some very handy instruments are available in the market, of which mention should be made of the so-called Freezometer, which can be procured for a small sum.

Another disadvantage of alcohol is that the denatured product has been put into that condition by mixing with it such materials as pyridine, which in no way go to improve the smell of the oft-abused commodity. At the same time it should be carried in mind that alcohol is combustible, and if it is not carefully watched, might cause considerable trouble in this direction.

Glycerine has a very low freezing-point and boils at a high temperature, both of which features would tend to make it a desirable anti-freezing substance. If, however, the commercial, not the chemically pure, product is used, for the sake of its low price, the fatty acids contained in it will spell disaster to the tender metallic portions of the cooling system, especially the radiator. On the other hand, pure glycerine is very expensive, and rapidly dissolves all impurities it comes in touch with, so that pretty soon the cooling system of the motor will be bound to suffer if glycerine is introduced. It has the one advantage in common with salt solutions that it does not evaporate like alcohol, and in refilling the cooling system only pure water has to be added.

Some experiments have been made as to the usefulness of lubricating oil as a cooling medium, but they have not been successful. Oil has a low specific heat, and while its freezing point is low enough to insure the oil remaining liquid at all practical temperatures, its boiling point is likewise low, so that only comparatively small quantities of heat may be carried to the radiator by a given volume of oil. Furthermore, if air is caught in the piping system, a great deal of the hot oil will be burned and the resulting odors will be found far from pleasant by the occupants of the car.

All things considered, common salt, *i. e.*, sodium chloride, may be looked upon as the cheapest and best anti-freezing chemical. Nevertheless, a great number of automobilists prefer other compounds, partly because they have to pay more for them, and partly because the foregoing statement sounds too good to be true. There are few people who understand that the commonest are the most important materials in life as well as in automobiles, and that, for instance, air and water are the most precious and effective foods, even if we cannot live on them alone like the lilies.

Calendar of Coming Events

Shows

Dec. 30-Jan. 6.....Buffalo, N. Y., Annual Show, Seventy-fourth Regiment Armory, Buffalo Automobile Trade Association.
Jan. 2-11.....New York City, Hotel Astor, Importers' Salon.
Jan. 6-13.....New York City, Madison Square Garden, Twelfth Annual Show, Pleasure Car Division, Automobile Board of Trade.
Jan. 6-20.....New York City, Madison Square Garden, Annual Show, Motor and Accessory Manufacturers.
Jan. 10-17.....New York City, Grand Central Palace, Twelfth Annual Show, National Association of Automobile Manufacturers; also Motor and Accessory Manufacturers.
Jan. 13-19.....Milwaukee, Wis., Auditorium, Fourth Annual Show, Milwaukee Automobile Dealers' Association
Jan. 13-27.....Philadelphia, Annual Show, First and Third Regiment Armories, Philadelphia Automobile Trade Association.
Jan. 15-20.....New York City, Madison Square Garden, Twelfth Annual Show, Commercial Division, Automobile Board of Trade.
Jan. 15-20.....Toledo, O., Annual Show, Terminal Building, Toledo Automobile Dealers' Association.
Jan. 22-27.....Rochester, N. Y., Annual Show, State Armory, Rochester Automobile Dealers' Association.
Jan. 22-27.....Detroit, Mich., Wayne Gardens, Eleventh Annual Show, Detroit Automobile Dealers' Association.
Jan. 22-27.....Providence, R. I., Providence State Armory, Rhode Island Licensed Automobile Dealers' Association, Automobile and Accessories Show.
Jan. 22-27.....Dubuque, Iowa, Annual Show Dubuque Automobile Dealers' Association.
Jan. 27-Feb. 10....Chicago Coliseum, Eleventh Annual Automobile Show under the auspices of the National Association of Automobile Manufacturers. Pleasure cars, first week. Commercial vehicles, second week.
Jan. 27-Feb. 10....Pittsburgh, Pa., Sixth Annual Show, Automobile Dealers' Association of Pittsburgh, Inc. Pleasure cars, first week. Commercial vehicles, second week.
Jan. 29-Feb. 3.....Scranton, Pa., 13th Regiment Armory, Second Annual Show.
Feb. 1-7.....Washington, D. C., Annual Show, Convention Hall.
Feb. 3-10.....Montreal, Canada, National Show, Drill Hall, Automobile Club of Canada.
Feb. 5-10.....Buffalo, N. Y., Convention Hall, George C. Fehrman.
Feb. 5-17.....St. Louis, Mo., Coliseum, Annual Show, Pleasure cars, first week. Commercial vehicles, second week.
Feb. 12-17.....Ottawa, Ont., Howick Hall, Annual Show, Ottawa Valley Motor Car Association.
Feb. 12-17.....Kansas City, Mo., Annual Show, Combined Association of Motor Car Dealers.
Feb. 12-19.....Dayton, O., Third Annual Show, Dayton Automobile Club.
Feb. 14-17.....Grand Rapids, Mich., Third Annual Show.
Feb. 17-24.....Pittsburgh, Pa., Second Annual Show, Exposition bldg., Pittsburgh Auto Show Association, Inc.
Feb. 17-24.....Newark, N. J., Fifth Annual Automobile Show, New Jersey Automobile Exhibition Company, First Regiment Armory.
Feb. 17-24.....Minneapolis, Minn., National Guard Armory and Coliseum, Annual Automobile Show, Minneapolis Automobile Show Association.
Feb. 19-24.....Omaha, Neb., Seventh Annual Show, Auditorium, Omaha Automobile Show Association.
Feb. 19-24.....Hartford, Conn., Annual Show, Automobile Club of Hartford, State Armory.
Feb. 19-24.....Cincinnati, O., Annual Show, Music Hall, Cincinnati Automobile Dealers' Association.
Feb. 20-24.....Binghamton, N. Y., State Armory, Third Annual Show, Automobile Dealers' Association.
Feb. 20-28.....Baltimore, Md., Annual Show, Baltimore Automobile Dealers' Association.
Feb. 21-24.....Louisville, Ky., Fifth Annual Show, First Regiment Armory, Louisville Automobile Dealers' Association.
Feb. 21-28.....Toronto, Ont., Annual Show, The Armouries, Toronto Automobile Trade Association.
Feb. 24-March 2...Brooklyn, N. Y., Twenty-third Regiment Armory, Annual Show, Brooklyn Motor Vehicle Dealers' Association.
Feb. 26-Mar. 2.....Elmira, N. Y., Second Annual Show, Elmira Automobile Club.
Feb. 26-Mar. 2.....Paterson, N. J., Annual Show, Fifth Regt. Armory, Paterson Automobile Trade Association.
Feb. 28-Mar. 2.....Davenport, Iowa, Annual Show, Davenport Automobile Association.
March 2-9.....Boston, Mass., Tenth Annual Show, Boston Automobile Dealers' Association, Inc.
March 4-9.....Denver, Col., Auditorium, Annual Show.
March 4-9.....Denver, Col., Annual Show, Auditorium, Motor Field.
March 6-9.....Tiffin, O., Second Annual Show, The *Advertiser*.
March 12-16.....Syracuse, N. Y., Fourth Annual Show, State Armory, Syracuse Automobile Dealers' Association.

Meetings, Etc.

Dec. 20.....New York City, Waldorf-Astoria, Annual Banquet of the Automobile Club of America.
Jan. 18-20.....New York City, Annual Meeting of the Society of Automobile Engineers.

Race Meets, Hill-Climbs, Etc.

Dec. 25-26.....Los Angeles, Cal., Track Races, Motordome.

THE AUTOMOBILE

Vol. XXV Thursday, December 21, 1911 No. 25

THE CLASS JOURNAL COMPANY

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231-241 West 39th Street, New York City

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Entered at New York, N. Y., as second-class matter.
The Automobile is a consolidation of The Automobile (monthly) and the Motor Review (weekly), May, 1902, Dealer and Repairman (monthly), October, 1903, and the Automobile Magazine (monthly), July, 1907.

Prolific Patent Litigation

"I WOULD readily put over $50,000 into the manufacture of the device, but it is so easy to make that we would enter immediately into a prolonged ordeal of patent litigation which would eat up all of our profits." This statement, recently made by the holder of a basic patent on a new device in connection with the winter use of automobiles, strikes a chord in the present condition of the automobile industry which is not at all a pleasant one; namely, the entire disregard of patent rights in conjunction with many car articles. It is only within the last few years that what might be termed an acute situation has arisen in this connection. At present there are hosts of cases pending in the courts, which cases are based on patents that in some cases are comparatively unknown. These patents have been acquired within the last few years and have been held quietly until the holders had decided whether the infringements were sufficiently general to demand prosecution. With several of these patents the owners cannot but have realized that their claims were not broad enough to cover what they looked upon as infringements, but they nevertheless have prosecuted several small makers, knowing that often a patent case is decided by the size of the available litigation fund. In other instances the exact opposite is the case: the patent owners have had specially broad claims, claims that nearly every infringer knew would certainly be upheld, but the infringers figured that the case would occupy many years in court and during that time there would be ample opportunity to get all they desired out of the situation. It is unfortunate that patent litigation is and has been so slow. Often the life of a patent has almost expired before its validity is settled. There should not be any necessity for this. It should not require 15 years to determine whether there has been any interference, and it should not require 15 years for a few judges to settle what they consider the actual meaning of the claims and construction of a patent.

A probable solution could be had in the establishment of a special patent court in which the judges on the bench would be particularly qualified to readily decide on the merits of mechanical claims and constructions. The necessity for such can be seen in the fact that in some cases judges have reversed their own decisions of a few months or years previous. Apparently the only reason for such conditions is lack of familiarity with the principles of engineering underlying the cases at issue. To settle many intricate patent litigation suits has called for specially clear insight into matters technical, and it is scarcely expected that different judges should be able to act with dispatch in such cases.

* * *

Shows and Contests Pay

France has relented: She is going back to the annual show and she is going back, if she can, to the Grand Prix road race. Both are for 1912. It is only a few years ago that the French makers stood up and said to the remainder of the automobile world that they did not need an annual show; that it was only a bill of expense to them; and that, by inference, their products were so far in advance of those of other countries that special exhibition of them was not needed more than once in two years. The Englishman, who was caught napping in the early days of the automobile, saw the lapsing of France and jumped into the gap with his international Olympia and got away with the goods. The Frenchman has at last realized the situation and now wants the annual show. Next fall there will be the rival displays on either side of the channel. What the outcome will be is not of particular interest on this side of the Atlantic just at present, as it will not affect either the New York or Chicago shows whether there are two big shows in Europe or if there are half a dozen. There is one big point that does interest American automobile builders, however, and that is that a show is a necessary factor in the industry today. During the last 6 or 7 years there have been a few makers who felt that they did not have to go to shows to sell their product. Several have seen the error of their ways and are getting into the show circle this year. Many makers who have done good business for the last couple of seasons have been talking about the futility of shows, but these people had better beware. The experience of the Frenchman is a good one to ponder over and to take lessons from. This is an age of publicity and it does not call for many consecutive months of obscurity to let a maker of renown fall out of public approval. The shows are great publicity features; they focus the attention of the entire nation on the automobile, and although the sales may not be as large as desired the results cannot be counted by actual sales made. The results of show work extend through the following 6 months of selling. The maker who exhibits may not know this so well as the maker who does not exhibit. During the show period there is a mass of missionary work done. The selling seed has been dropped into soil of unexpected fertility and the harvest has always been a good one. The shows and contests constitute excellent vehicles for keeping the automobile in the public eye and both should be encouraged and sustained. There are many examples of foolish prodigality during show weeks. This can be eliminated and the value of the show not reduced in the least.

All Jersey Working for Sane Law

THE following notice as to the legal situation in New Jersey has been issued by the joint legislative committee representing all the warring factions of New Jersey motordom.

All motorists in New Jersey are vitally interested in automobile legislation that has for its principle "that motorists from other states desiring to tour in New Jersey shall be permitted to do so for a limited period of time without requiring them to take out registration or sign power of attorney, when they have been properly registered in their own state, provided that state extends the same privileges to the motorists of New Jersey," and they will remember the strenuous efforts that were brought forth last year to have the Legislature pass a reciprocity bill and the fact that it was defeated in the Senate by only one vote, the vote being a tie.

It should be a great satisfaction for them to now learn that through organization special efforts are being put forth this year to secure the legislation that they all so much desire, and they will no doubt be interested to learn that the principal and largest automobile organizations of the state, representing every shade of opinion among organized motorists, both from the trade as well as owners of automobiles, have gotten together on this subject, and there has been a joint committee appointed.

This committee is known as the Joint Legislative Committee of the Automobilists of New Jersey, and has full power to take charge of the proposed automobile legislation this Winter in the interests of all motorists, irrespective of club affiliations, and they have every hope that the labors of this committee will be crowned with success, and that the present unfavorable attitude of the New Jersey law in regard to visiting motorists will be done away with and that we shall have reciprocity between the various states.

The Joint Legislative Committee of the Automobilists of New Jersey is composed of five representatives from the New Jersey Automobile Trade Association, five representatives from the Associated Automobile Clubs of New Jersey, and five representatives from the New Jersey Automobile and Motor Clubs.

The representatives from the New Jersey Automobile Trade Association are as follows:

Geo. Blakeslee, Geo. H. Smith, Louis Fitzgerald, W. H. Ellis, Geo. Paddock.

Those from the Associated Automobile Clubs of New Jersey are as follows:

W. Eugene Turton, Jos. H. Wood, W. Clive Crosby, J. H. Edwards, Geo. Post.

Those from the New Jersey Automobile and Motor Club are as follows:

Richard C. Jenkinson, G. O. Groebe, Ira Kipp, Jr., Horace P. Cook, Melville A. Carpenter.

If New Jersey is not brought back into the automobile "union" this Winter, it will not be due to the failure of the motorists of this state presenting a united and determined effort or the failure of an earnest and hard working representation.

Michigan Law to Be Sharply Tested

DETROIT, MICH., Dec. 18—The constitutionality of the Michigan law which holds the owner of a motor car responsible for damage done by his machine unless he can prove that the machine had been stolen from him, was attacked in the Federal court here last week, in the suit brought by John Parrott, of Mt. Clemens, against the Metzger Motor Car Co., arising out of an accident on the Gratiot road some time ago. Judge Angell strongly intimated that he believed the point well taken, but preferred to leave the determination of the question to a higher court. Accordingly he permitted the case to go to the jury, which brought in a verdict for $1,843 against the Metzger Co. It is certain that the case will be appealed.

Parrott was driving a team from Detroit to Mt. Clemens on the Gratiot road, when an automobile, owned by the Metzger Motor Car Co., and driven by one of its employees, crashed into the farmer's cart, overturning it, killing one of the horses and injuring Parrott. The company admitted ownership of the car and lack of negligence on the part of Parrott, but denied responsibility for the accident on the ground that the driver of the car was using it without permission. On this theory, Attorney Brennan, representing the Metzger Co., moved the court to direct a verdict of no cause for action, but as this was the first time the constitutionality of such an act had been questioned he was unable to find any decisions covering the point.

Judge Angell acknowledged that, in overruling the motion, he acted with some hesitancy because the motor car seemed to be legislated against in this instance.

"The motor car is not like dynamite or nitro-glycerine," said the court. "We who live in Detroit are familiar enough with it to know that it has no inherent qualities of danger. The same degree of responsibility does not attach to the owner of a horse and wagon, and it seems unfair to place the owner of an automobile in a special class."

In his argument to the court, Attorney Brennan said:

"It is class legislation when a man, because he has money enough to purchase an automobile instead of a horse and buggy, is put in a separate class with heavier responsibilities. The law of Michigan which makes an automobile owner responsible for damage done by his machine unless he can prove that it was stolen and can prove the intent of the thief, puts every automobile owner at the mercy of the hoodlums of the street who 'borrow good people's machines to go joy-riding."

Judge Spier, of Mt. Clemens, who appeared for the plaintiff, defended the law on the ground that the state has power to make police regulations for the protection of citizens against careless and reckless driving of motor cars. If persons sustaining damage were unable to recover from the owners of motor cars they would be unable to get redress from any source, he declared.

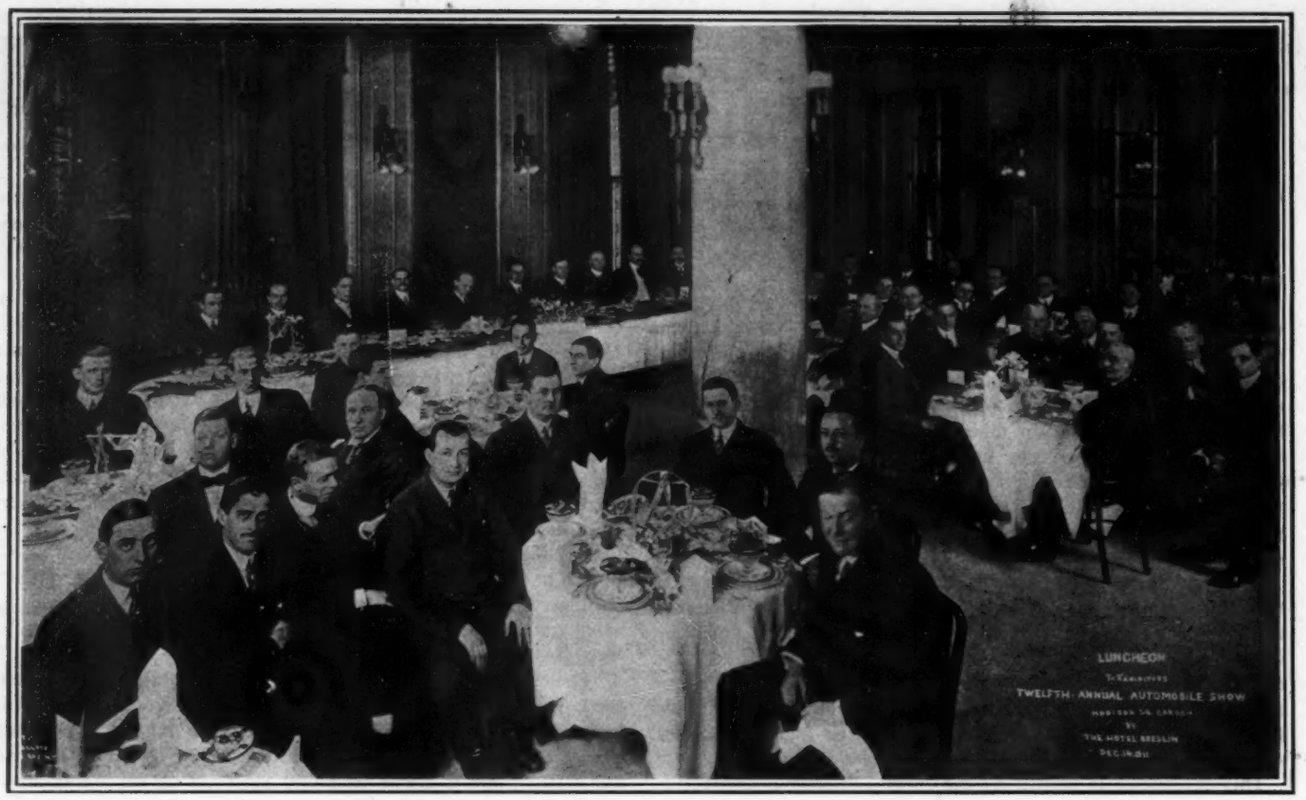
It is understood that the Metzger Co. is determined to take the case to the Supreme Court of the United States, if necessary. The first appeal will be to the Circuit Court of Appeals at Cincinnati.

Jersey Mayors to Abolish Death Traps

Grade crossings in New Jersey are to be abolished, root and branch, if the purpose of the mayors of various cities in the State is carried out. The mayors will form an organization Jan. 6, at Trenton. A preliminary meeting was held Tuesday at East Orange where the determination to form an association was crystallized. Under the plan it is intended to abolish grade crossings in counties of the first class by July, 1914, and throughout the State by 1920.

A bill will be drafted for presentation to the coming legislative session.

MANY TOO LATE—Inquiries are being received daily regarding the reservation of space at the Madison Square Garden show. This is one of the cases where the early birds have made away with the worm as the space has long since been completely closed out.



Luncheon given by Hotel Breslin management to exhibitors at the Garden Show

News of Shows, National and Local

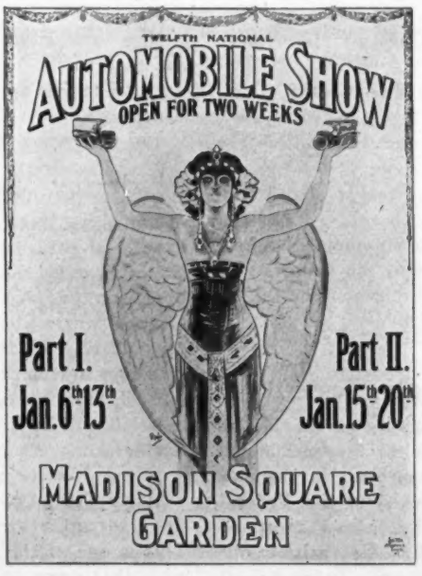
WHEN Madison Square Garden throws wide its doors for its last function—the Twelfth National Automobile Show on January 6—hundreds of motoring enthusiasts will have opened to them the most magnificent and biggest automobile display ever seen in the nationally famous building.

For 1912 the pictorial idea is that of a mammoth Oriental garden. The color scheme is to be crimson and gold with smatterings here and there of blue, green and white.

The exhibition spaces on the main floor, elevated platform and balcony will be carpeted with a specially woven fabric of green hue giving the appearance of the cars reposing on grass. Entering from the foyer the visitor will be confronted by a huge fountain. Back of the fountain, in the center, is a statue representing The Motor Era. The water from the fountain will be electrically radiant, made so by iridescent and hidden electric bulbs. All about the fountain are eight allegorical figures 10 feet high arched by garlands of natural flowers. Six bay trees are recessed in the front of the fountain. Beyond this fountain will extend the main display space.

The plan of having the elevated platform and balcony above the arena boxes project over the main floor and of covering the high rear seats so as to make a sort of mezzanine floor will be repeated.

A novel feature of the decoration this year will be the treatment of the ceiling which will have the appearance of an inverted oriental rug with rich coloring and treatment. This gigantic painting will cover the steel girders of the ceiling and will gracefully hang down the sides. The total weight of the canopy is more than 3 tons. The figure in the center panel of the painting represents the triumph of the industry. The panel measures 100 by 200 feet.



Poster for the Garden Show

Plans for the new arena, which in future will augment the space available for show purposes of the Grand Central Palace, will be completed Saturday night and will be submitted to the New York Central Railroad and the management of the palace immediately afterward.

Several changes have been made in the draft first prepared and the present plans contemplate a building more commodious in every way than the one originally considered. Dates for actual commencement of work will be announced in the near future.

Invitations are being prepared by the management of the N. A. A. M. show at the Palace for all the exhibitors who will show at the Garden, and on opening night

it is expected that the Board of Trade exhibitors will attend in a body.

Tuesday and Thursday have been designated during show week as society nights and special preparations have been made to arrange suitable programs.

A Score of Exhibitors at the Salon

The twenty different makes which will be exhibited at the Importers' Automobile Salon include every foreign car which has achieved distinction either in this country or abroad. The English Daimler, Panhard, Mercedes and Minerva exhibits will include models having Silent Knight sliding sleeve-valve motors. while those of the Itala and Darracq will have models with new rotary valve motors. The latter are entirely new to the automobile public in this country and will attract much attention from the visitors to the Salon.

It is perhaps the magnificent bodies, particularly those of the inclosed type, mounted on the various chassis exhibited at the Salon, which are of the greatest interest. They are the products of the well-known body builders of Europe and America, whose names are synonymous with ultra-luxuriousness.

New Cars to Make Their Bow at Detroit

DETROIT, MICH., Dec. 18—Detroit's Eleventh Annual Automobile Show, to be held in the Wayne Gardens and the new Annex, 108 feet wide by 165 feet long, promises to be without any doubt America's leading local show and the largest local exhibition in the country if not the most important. The trade of Detroit accepted readily the proposition of the D. A. D. A. to construct this building providing they would take space.

It is known generally that a great many of the Detroit exhibitors will display for the first time new cars, which they will not have ready for the New York show; but which will be completed in time for Detroit and Chicago and later shows.

Change of Plans at Philadelphia

PHILADELPHIA, Dec. 18—A radical departure in the plans for the second week of the local Automobile Show has been announced, necessitated by reason of the large number of applications for commercial vehicle space. Originally being the intention to confine the motor truck display to the Third Regiment Armory, during the second week, January 22 to 27 inclusive, the revised plans comprehend the exhibition of commercial cars at the First Regiment Armory, in addition; thus the show in the latter building, instead of being devoted exclusively to electrics, will consist of electric pleasure cars and equipment and of commercial cars.

National Will Show in Breslin Lobby

Out of a field of twenty-one, W. C. Poertner, of the Poertner Motor Car Co., handling the National line in the metropolis, drew the lucky number at the annual luncheon tendered to the automobile trade in New York by the management of the Hotel Breslin, and as a result the National company will have the privilege of exhibiting one of its models in the lobby of the hotel during the coming show.

S. A. Miles presided and the speakers included: Alfred Reeves, H. A. Bonnell, A. G. Batchelder, M. L. Downs and several others.

News of Other Local Shows

BALTIMORE, MD., Dec. 16—The Baltimore show will be held February 20 to 28, inclusive, under the joint auspices of the Automobile Club of Maryland and the Baltimore Dealers' Association. The Fifth Regiment Armory has again been secured. Commercial cars will be shown on the last three days of the show exclusively, the first five days being devoted to pleasure vehicles. Dealers in accessories will have their exhibits on hand on all of the eight nights of the show. The joint committee will consist of Dr. H. M. Rowe, president of both the Club and Dealers' Association, chairman; Joel G. Nassauer, Thomas G. Young, H. K. Luzius and John B. Bridges, representing the club and R. J. W. Hamill, A. S. Zell, F. S. Blfven and W. L. Duck, representing the dealers.

SIOUX CITY, IA.—The annual automobile show under the auspices of the Sioux City Automobile Dealers' Association, will be held in the latter part of February, or early in March. As the Omaha show is from February 19 to 24, and the Des Moines show, March 4 to 9, it is planned to hold the Sioux City show between these shows. C. M. Wyckoff was re-elected as president of the association. The other officers are: H. A. Wetmore, vice-president; Ralph Wigton, secretary; F. H. Reid, secretary; executive committee, H. B. Groves, H. A. Wetmore, and S. C. Douglas.

TOLEDO, O., Dec. 18—The approaching Toledo Automobile Show promises to eclipse anything of the kind ever undertaken here. Exhibitors are enthusiastic, and all available space will be taken by the concerns handling cars and accessories. An extensive advertising campaign throughout northwestern Ohio will be inaugurated, and indications for success are of the brightest. The Terminal building, which was selected as a location for the show, is being prepared and beautified, and nothing will be left undone by the managers of the exhibition to attract the attention of the public generally.

DAYTON, O., Dec. 15—Committees representing the Dayton Automobile Club and the automobile dealers of the city have selected Elmer C. Redelle, manager of the Dayton baseball team, to take charge of the annual automobile show, which will be held February 12-19. The club committee is composed of William Stroup, Walter Kidder, E. A. Deeds and Walter Kuhns. The dealers are represented by George L. Baker, William H. Yeazell, Earl Hosler, George W. Shroyer and G. G. Peckham. Plans for the show will be begun at once. The show will be the third held in Dayton.

CLEVELAND, O.—Automobile manufacturers and dealers and the Cleveland Automobile Club will work jointly this year toward the success of the Cleveland automobile show to be held in Central Armory, February 17 to 24, inclusive. Frank W. Philips resigned as chairman of the show committee recently. H. M. Adams was chosen to fill the vacancy. Fred H. Caley, secretary of the Cleveland Automobile Club, was named as manager of the show by the show committee.

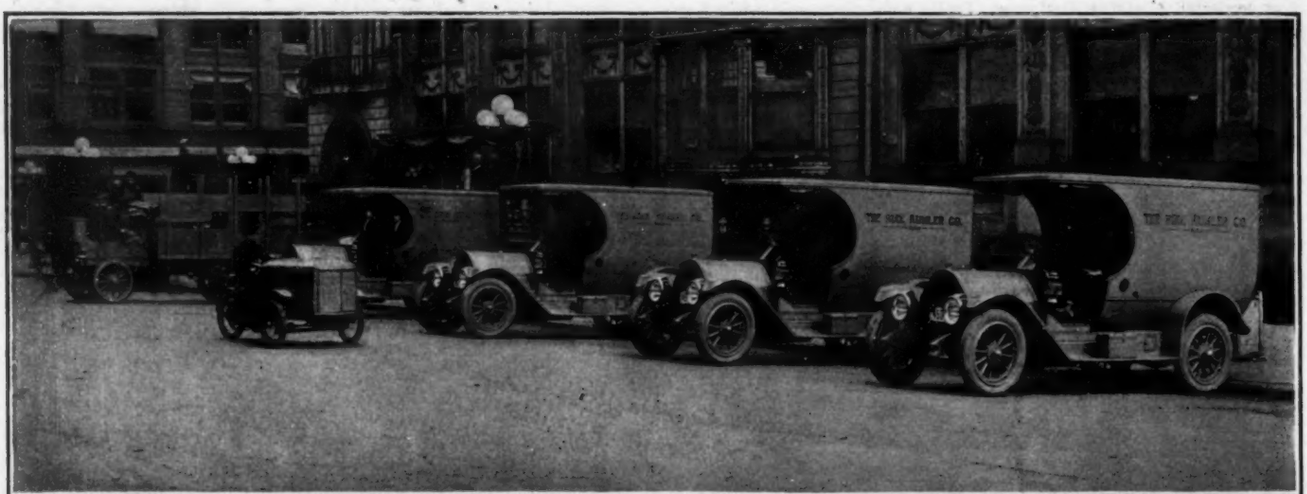
SYRACUSE, N. Y., Dec. 16—The Automobile Dealers' Association is perfecting plans for the third annual automobile show in the Armory in March. An effort is being made to find a place of exhibition for trucks and accessories, because of the heavy demands for space made by manufacturers of passenger cars.

MILWAUKEE, WIS., Dec. 18—Space for the fourth annual Milwaukee show, to be given by the Milwaukee Automobile Dealers' Association in the Auditorium, Jan. 13 to 19 inclusive, was allotted last week and the results show that there will be seventy pleasure car exhibits, thirty of commercial cars and fifty-one of accessories.

DES MOINES, IA.—Des Moines had a small-sized automobile show last week as an adjunct of the state convention and show of the Iowa Implement Dealers' Association, at the Coliseum. Many of the dealers showed automobiles along with their implements.

BUFFALO, Dec. 18—Space in the second automobile show of the Buffalo season will be alloted December 29. The show will be held in Convention Hall, February 5-10. The enterprise is under the management of George C. Fehrman.

DUBUQUE, IA., Dec. 18—Dubuque automobile dealers have formed an association for mutual protection. They also propose to hold an automobile show during the week commencing January 22, 1912.



NEWS of the WEEK CONDENSED

Auto delivery equipment of a Dayton, Ohio, department store, all supplied with Apico Model A3 electric lighting system

DETROIT, MICH.—The Wolverine Motor Supplies Co. has increased its capital from $10,000 to $25,000.

MONTREAL, QUE.—The Motor Import Co., Ltd., has taken the agency for the Hupmobile in this city.

CHARLOTTE, N. C.—J. D. and M. W. Woodsides are arranging to build an automobile repair shop and garage.

WASHINGTON, D. C.—Emerson & Orme, 1407 H street, N. W., have added the Fiat to their line, which consists of the Apperson and Detroit Electric.

LINCOLN, NEB.—H. E. Mason, formerly with the Shamp Implement Co., has purchased an interest in the Sidles Motor Co., succeeding G. E. Swope as manager.

WASHINGTON, D. C.—C. Cassard Schroth, agent for the Stearns, has taken quarters with the Wilson Co., 918 Fourteenth street, N. W. The latter handles the Cole and Krit.

SPOKANE, WASH.—The Mitchell automobile will be represented by the Metropolitan Motor Car Co. Manager Harry Bell recently announced the relinquishment of the Marion.

NEW YORK CITY—The Schildwachter Carriage Co., 128th street and Park avenue, has taken the eastern agency for the Sternberg truck. The company also handles the McIntyre power wagon.

AKRON, O.—The B. F. Goodrich Co. announces the opening of three new branches in California, at Fresno, Oakland and Sacramento, these being in charge respectively, of the following managers: R. W. Peters, H. S. Smith and H. W. Schoenlaub.

ATLANTA, GA.—The Southern branch of the White Co. has followed the trend of the times and opened a show room on Peachtree street. The present garage and machine shop on Marietta street will be used as before.

LOUISVILLE, KY.—F. E. Van Patton has been selected as the manager of the new branch of the Ford Motor Co. Before coming to this city Mr. Van Patton was assistant manager of the Cleveland branch of the Ford Motor Co.

BOSTON, MASS.—The Matheson Co. has secured the new building erected for the Alco and Stoddard-Dayton on Commonwealth avenue recently, and which was vacated when those two cars were changed from agencies to branches.

PHILADELPHIA—The Gomery-Schwartz Motor Car Co., local distributor of the Hudson, has removed from the southwest corner of Broad and Callowhill streets to larger and more modern quarters at Nos. 253-255 North Broad street.

MILWAUKEE, WIS.—T. A. Brinn, formerly head of the motor assembly department of the Wisconsin Motor Manufacturing Co., has taken a similar position with the Beaver Manufacturing Co. The Beaver company has been reorganized recently by General Manager Lewis.

WASHINGTON, D. C.—E. C. Bull has resigned as manager of the Pope Automobile Co., agents for the Pope-Hartford and Marathon, to accept a position with the New York branch of the Lozier Motor Co. He has been succeeded by H. N. Dewitt.

TACOMA, WASH.—The past week there congregated in Tacoma all the Jackson automobile dealers of the Northwest, who came to view the latest models turned out by the Jackson Automobile Co. They were the guests of Northwest Manager F. E. Cady.

DENVER, COL.—The Denver Motor Club has leased Overland Park for 5 years. The organization will have one of the best equipments in the country including all the conveniences and luxuries of a country club and a race track which will be banked and prepared for speeding.

PHILADELPHIA—The Streator Motor Car Co., of Streator, Ill., manufacturer of the Halladay car, has opened an Eastern distributing sales agency at Fifteenth and Oxford streets in this city. The agency's territory will comprise Pennsylvania, New Jersey, Delaware and Maryland.

MILWAUKEE, WIS.—The KisselKar Co., representing the Kissel Motor Car Co., of Hartford, Wis., in Wisconsin and several other states, has moved into its new garage and salesroom building at 176-178-180 Seventh street. The new building cost $45,000. Frank J. Edwards is manager of the company.

MILWAUKEE, WIS.—Raymond C. Agner, of Burlington, Wis., inventor of an oil and grease gun and other motor car specialties, tools, etc., has been granted patents on an adjustable spark plug wrench, to be marketed under the trade mark of Simplex. It will be manufactured by Mr. Agner's company at Burlington.

MILWAUKEE, WIS.—C. A. Hamilton, for six years vice-president and manager of the Wisconsin Engine Co., of Corliss, Wis., has resigned to become associated with the Lavigne Gear Co. of Milwaukee, a reorganization of the Lavigne Gear Co. of Detroit, which recently established a plant at Corliss to manufacture steering gears and has taken quarters in Milwaukee to be used as general offices.

REDMOND, ORE.—Powers & Hess are installing an automobile repair shop here.

MONTREAL, QUE.—The Pope-Hartford Co. of Canada will handle the Pope-Hartford in this city.

RIPON, WIS.—Edward Bobzin, proprietor of the Bobzin Garage, has taken the agency for the Buick in this territory.

NEW YORK CITY—The J. I. Case Co., of Racine, Wis., has opened a branch at 1850 Broadway. O. A. Lewellen is in charge.

TORONTO, ONT.—The McLaughlin Carriage Co. of this city are agents for the Fiat car and for the Rauch & Lang electric.

NEW YORK CITY—H. E. Steinbock has severed his connection with the engineering department of the United States Motor Co.

ERIE, PA.—G. H. Henry has bought out the interest of his partner, E. A. Semmence, in the Hupmobile Sales Co., of 1319 Peach street.

KANSAS CITY, MO.—A new brick garage is to be erected at 1713 McGee street by McGiloray & Bowling. The building will cost $4,000.

MONTREAL, QUE.—E. Major, 37 St. Catherine street West, has been appointed Canadian representative of the Delaunay-Belleville car.

MONTREAL, QUE.—Automobile Francais is the name of the company which has taken the agency for the Renault, Berliet and Gregoire cars.

CINCINNATI, O.—William Duffy, formerly with the Motor Supply Co., of this city, has associated himself with the Fisk Rubber Tire Co., 816 Main street.

MONCTON, N. B.—The International Automobile Co. of Moncton has been incorporated to deal in automobiles. The company is capitalized at $50,000.

MONTREAL, QUE.—The National Motor Co. of Canada, Ltd., has changed its name to the Windsor Auto Garage & Engineering Co. and will devote itself entirely to the garage business.

CINCINNATI, O.—The Chas. Behlen Sons Co., distributor of the Locomobile and the Detroit Electric, is making extensive improvements in its showroom at Fifteenth and Vine streets.

FREMONT, O.—The Lauth-Juergens Co., of this city, has appointed the following agents: Mutual Auto Co., Duluth, Minn.; P. A. Brink, Los Angeles, Cal., and A. S. Lascelles & Co., New York.

PROVIDENCE, R. I.—The 1912 Alco limousines are equipped with marine windows which, beside relieving the car's continuity of line, enable the driver to obtain an unobstructed view to the rear.

CINCINNATI, O.—The first six-cylinder police patrol to leave the Packard factory was recently delivered to the local police department. The body is mounted on a standard with extra-heavy springs.

ROCHESTER, N. Y.—William Knipper, who drove a Mercer in the recent races at Savannah, Ga., has retired from the field of automobile racing and has taken the agency for the Stutz car in this territory.

WASHINGTON, D. C.—The Overland-Washington Motor Co. has been appointed agent for the Garford line of pleasure cars and trucks. Considerable territory in Virginia and Maryland has been given the new agency.

FLINT, MICH.—A. B. Hardy has resigned his position with the General Motors Co. as general manager of the Marquette Motor Co., of Saginaw, Mich., to become general manager of the Little Motor Car Co., of this city.

WILLIAMSPORT, PA.—Messrs. Weller and Davidson have organized the Central Garage of Williamsport to do a general machine shop and automobile repair business. They will handle the Matheson car in this territory.

ST. LOUIS, MO.—The Behen Automobile Equipment Co., Kingshighway and Delmar avenue, has commenced business and will handle automobile supplies and accessories. John J. Behen is president and treasurer and S. F. Behen is secretary.

DES MOINES, IA.—The Capital City Carriage Co., Des Moines, agent for the Jackson, has taken uptown quarters. This company has represented the Jackson here for several years but has always conducted the business from the factory.

NEW YORK CITY—Chas. E. Riess & Co., general eastern distributors of the Marion car, and the American-Marion Sales Co., metropolitan distributor of American and Marion cars, have moved into their new offices and salesrooms at 1896 Broadway.

LOUISVILLE, KY.—The Ford Motor Co., of Detroit, Mich., has selected F. E. Van Patton as the manager of its new branch here. Mr. Van Patton has been connected with the company for some time as assistant manager of the Cleveland, O., branch.

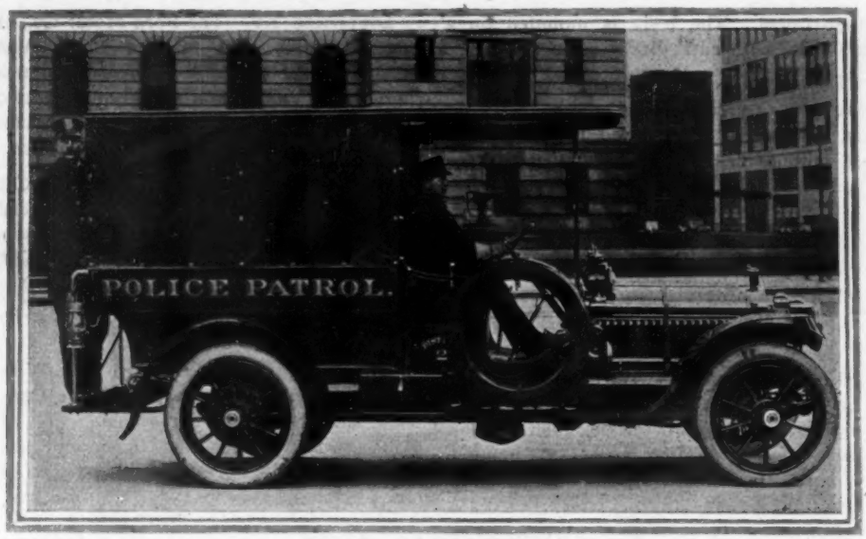
STREATOR, ILL.—The Streator Motor Car Co. has appointed the following special factory representatives: L. W. Thompson, Oklahoma and part of Kansas; C. R. Reilly, part of Iowa; F. S. Van Veghten, Nebraska, and the Mound City Buggy Co., Missouri.

BRIDGEPORT, CONN.—Leonard W. Williams, until recently manager of the Oakland branch of the Locomobile Co. of America, has come East to become associated with the advertising department of the Locomobile company. Mr. Williams, prior to his work on the coast, was connected with the Philadelphia branch of the company.

ATLANTA, GA.—The movement to do away with horse-drawn vehicles in all the departments of Atlanta's municipal work goes steadily ahead. The latest addition to the Gate City's fleet is a White Truck for the tapping and construction department of the city waterworks. The sanitary, hospital, construction, waterworks, police and fire departments all use machines and find them much more efficient than horses.

MILWAUKEE, WIS.—The Smith-Hoppe Auto Company, state agent for the Hupp-Yeats electric and local agent for the Oakland and R. C. H., has moved to its new garage at Wisconsin and Cass streets, erected at a cost of $45,000. The Wisconsin Auto Sales Company, state representative of the National, Herreshoff, Cutting and Westcott, has also taken quarters in the new garage, which is one of the largest in point of one-floor space in the city of Milwaukee.

View of 1912 Alco limousine, showing new marine windows in rear



Packard patrol wagon now doing duty in the Cincinnati police department

AKRON, O.—D. H. Holloway, Central Savings & Trust building, has taken the local agency for the Elmore.

SYRACUSE, N. Y.—The Porter-Cable Machine Company, of this city, is working full night and day shifts to turn out Hanna self starters.

COLUMBUS, O.—F. E. Avery, central Ohio agent for the Packard, will leave in the near future for a four-months' trip through Cuba, Panama and points in the West Indias.

CAMBRIDGE, O.—Otho Prince has secured a patent on an automobile fender which it is claimed is an improvement over the present fenders. The fender is intended to operate automatically.

CINCINNATI, O.—W. C. Woellner has resigned as purchasing agent of the Schacht Motor Car Company to become identified with the Instantaneous Auto Starter Company, in the capacity of sales manager.

INDIANAPOLIS, IND.—The Delaware Garage has started a clearing house for second-hand automobiles. The first sale was held on December 18.

INDIANAPOLIS, IND.—W. W. Bond, for some time city sales manager for the Brewer Auto Company, has resigned and will handle the agency for the Woten electric rectifier in Cook County, Ill.

CLEVELAND, O.—Ray M. Colwell, who recently resigned as local manager of the Buick Motor Co., has incorporated the Start-O Co., with offices at 1636 Walnut avenue N. E. Mr. Colwell is the inventor of the Victor self-starter.

AKRON, O.—Despite the uncertainty of a presidential election and the unsettled conditions usually found throughout the country in such years, Akron rubber manufacturers predict that next year will be the biggest in the history of the industry.

PHILADELPHIA, PA.—The D. Walter Harper Company, who introduced the Stanley Steamer here in 1903, has been the last to give up the sale of steam cars. It will represent the Case cars, as well as the Cameron air-cooled line of pleasure and delivery models.

BARBERTON, O.—Another rubber factory is soon to start operations here. The old factory building formerly used by the Carrara Paint Company has been sold to Adam Duncan, of Akron, O., and will be turned into a reclaiming plant. Six reclaiming machines will be installed.

PROVIDENCE, R. I.—J. F. Gfrorer has been announced in charge of the service department of the American Locomotive Company. Since joining this organization Mr. Gfrorer has been engaged in special work. Mr. Gfrorer has been associated with the motor industry since 1903.

AUBURN, IND.—Companies known as the Kansas City-Auburn Company and the Omaha-Auburn Company, which will be factory sales branches of the Auburn Automobile Company, have been organized and incorporated. Each company has an authorized capitalization of $10,000.

NEW YORK CITY—Louis Hendon has been appointed assistant superintendent in the service department of the Thomas Motor Company of New York. Previously Mr. Hendon was superintendent of the Mitchell repair shop here, and more recently had charge of the Packard shop in Savannah, Ga.

DETROIT, MICH.—The position of advertising manager of the Lozier Motor Company will be filled by James M. Evans, the vacancy having been created by the appointment of C. A. Emise as sales manager, to succeed F. C. Chandler, who has been appointed general manager of the Lozier Motor Company.

OMAHA, NEB.—T. V. Graves, of Chicago, has come to Omaha to take charge of the local branch of the Goodyear Tire Company. He has temporary quarters with the Powell Supply Company, which sold these tires previously. The company expects to move into a new building, now in course of construction at 2212 Farnam street, in a short time.

AKRON, O.—The work of extending facilities for Diamond tire service is still going on, four new service stations having been recently opened—three in the South and one in the Middle West. These new stores are located at 1316-18 Grand avenue, Kansas City; 910 Broadway, Nashville, Tenn.; 229 N. Tryon street, Charlotte, N. C.; 427 S. Twentieth street, Birmingham, Ala.

COLUMBUS, O.—Advance sheets of the annual report of James R. Marker, State Highway Commissioner of Ohio, shows that during the year ending November 15 there were constructed under state supervision 60.88 miles of highway. Of that amount 32.6 miles was water-bound macadam, 8.7 miles bituminous macadam, a small portion concrete and 19.2 miles brick.

MILWAUKEE, WIS.—George W. Browne, 458-462 Milwaukee street, state agent for the Overland and Marmon, last week entertained 52 of his Wisconsin sub-agents at the new Browne service building in Milwaukee. A banquet was given by Mr. Browne in the evening and T. C. Whitcomb, assistant sales manager of the Willys-Overland Company, Toledo, made the principal address.

DAYTON, O.—The Stoddard-Dayton department of the United States Motor Company has decided to centralize its local selling force at the plant and announcement is made of the appointment of Charles Hoffritz as agent. The local agency formerly was in the hands of the Dayton Automobile Company, on West Fourth street. This company will continue in the business and will sell the Winton Six and other lines.

INDIANAPOLIS, IND.—All Indiana agents for the Overland, numbering nearly 100, were entertained by the Fisher-Gibson Company at that concern's salesrooms on December 12. A dinner was served in the salesrooms. Among those present was John N. Willys, president of the Willys-Overland Company, and other representatives of the Overland factory. A theater party was given for the visitors during the afternoon.

INDIANAPOLIS, IND.—Visitors representing hundreds of thousands of dollars' worth of business were entertained last week at the Premier factory. All were Premier representatives at various points in the country and some of them rank among the most prominent automobile dealers in the United States. F. M. McFarland, the leading motor car dealer of Honolulu, was among the number. Premier cars will be shipped to Honolulu for distribution in the Hawaiian Islands on a bigger scale than ever.

DES MOINES, IA.—The Brown Corley Ellis Company has taken the Des Moines agency for the R. C. H. car.

SPRINGFIELD, MASS.—C. J. Clark and J. M. Greenlees have opened an agency here for the sale of K-R-I-T cars.

LOUISVILLE, KY.—The Kentucky Automobile Company has taken the agency for the Standard electric. This concern is also the agent for the Cadillac car.

CINCINNATI, O.—The W. C. Jungclas Company has taken the agency for the Thomas Flyer in this city. This concern also handles the Overland.

LOS ANGELES, CAL.—The Hayes Auto Sales Company has moved into its new quarters at 1225 S. Olive street. It will handle the Hayes and Krit cars.

MILWAUKEE, WIS.—The Pauly, Bruce & Goldacker Company, state agent for the Stoddard-Dayton, has taken the agency for the Universal and Chase truck lines.

SPRINGFIELD, MASS.—The Western Massachusetts Cadillac Company has been formed in Springfield by E. R. Clark, and the new company will handle the Cadillac product.

DES MOINES, IA.—J. E. Ullman closed a contract this week for the local agency for the Ohio car. He will have offices and show rooms with the Independent Auto Company.

LOS ANGELES, CAL.—The Pathfinder Motor Car Company is now located here and will handle the New Parry and Speedwell cars. It has leased the building at Pico and Hill streets.

WASHINGTON, D. C.—G. C. Bensinger & Bro., 301 Sixth street, N. W., agents for the Ohio, have secured the Grabowsky truck agency and will inaugurate a service department in connection with it.

NEW CASTLE, PA.—Patterson & Emery, prominent automobile dealers of this city, have contracted with the Franklin Automobile Company, of Syracuse, N. Y., to handle Franklin cars for the season of 1912.

FOND DU LAC, WIS.—W. C. Reinig was elected president of the Crescent Motor Company at the annual meeting. H. S. Wilson is secretary and treasurer. The company is building a large addition to its plant.

TOLEDO, O.—It is unofficially announced that T. W. Warner, president and general manager of the Warner Manufacturing Company of Toledo, will build a new plant at Muncie, Ind., to be operated by a company called the Warner Auto Parts Company.

BOSTON, MASS.—The Matheson Automobile Company will shortly open a completely equipped service bureau, a branch of the parent company of Wilkes-Barre. A large building on Commonwealth avenue especially constructed for automobile service has been chartered.

MILWAUKEE, WIS.—The National Brake & Electric Company, of Milwaukee, a unit of the Westinghouse interests, has increased its capital stock from $1,000,000 to $2,000,000. The company manufactures a number of compressed air and electrical devices and equipment for garages.

Automobile Incorporations

AUTOMOBILES AND PARTS

ALBANY, N. Y.—Park Automobile Co.; capital, $1,000. Incorporators: James Holroyd, Joseph W. Koreman, Michael Beck.

ASHTABULA, O.—High Level Auto Co.; capital, $10,000; to buy and sell automobiles. Incorporators: J. C. Topper, Earl Gardner, T. P. Fitzgerald, S. F. McDonald, Fred Squires.

BRIDGEWATER, MASS.—Wm. H. Bassett Co.; capital, $20,000; to make automobiles. Incorporators: Wm. H. Bassett, J. Gardner Bassett.

BROOKLYN, N. Y.—Ormond Motor Car Co.; capital, $100,000; to make automobiles. Incorporators: G. H. Howell, R. McKeller, T. Downs.

BROOKLYN, N. Y.—Royal Automobile Machine Co.; capital, $10,000; to make automobile parts. Incorporators: Sydney Solomon, Celia Trothstein, Louis B. Brodsky, Wm. M. Abel.

CAMDEN, N. J.—Auto Car Sales and Service Co. to make and sell motor cars.

CANTON, OHIO.—Stark Auto Co.; capital, $20,000; to sell automobiles. Incorporators: W. H. Burgener, Thos. C. Huth, Samuel Haenny, George Shaffer, Harlie C. Ellsworth.

CHICAGO, ILL.—F. A. L. Auto Co.; capital, $2,500; to sell motor cars. Incorporators: Frederick C. Harboer, Clinton S. Lamb, E. W. Landberg.

CHICAGO, ILL.—Simkin Mfg. Co.; capital, $2,000; to make and sell automobiles, accessories, etc. Incorporators: Albert J. Elliott, H. Prather Elliott, Jno. T. Evans.

CLEVELAND, OHIO.—Brooks-Norton Co.; capital, $10,000; to buy, sell and repair freight automobiles. Incorporators: W. K. Stanley, J. W. Brooks, Chas. L. Norton, H. N. Pettibone, R. L. A. Lieghley.

DETROIT, MICH.—Briggs-Detroiter Co.; capital, $200,000; to make automobiles. Incorporators: Jno. A. Boyle, Claude S. Briggs.

DETROIT, MICH.—Weit-Horton Mfg. Co.; capital, $25,000; to make and sell automobiles.

HANNIBAL, MR.—Long Silent Motor Co.; capital, $12,000; to make automobiles and engines. Incorporators: Elmer C. Long, Frank R. Tate, Theo. Moreno.

KALISPELL, MONT.—Koppang-Jordet Motor Co.; to conduct an automobile agency and garage.

LANSING, MICH.—New Era Motor and Mfg. Co.; capital, $50,000; to make automobiles. Incorporators: Wm. R. Smith, George Gilmore, John Scheidegger.

HATTIESBURG, MISS.—Southeastern Automobile and Machine Co.; capital, $50,000; to build automobiles. Incorporators: R. R. Boykin and others.

NEW ORLEANS, LA.—Commercial Truck & Automobile Co.; to make motor cars and trucks. Incorporators: Richard Brook, John D. Edwards.

NEW YORK CITY.—Detmar Auto Sales Co.; capital, $20,000; to deal in automobiles. Incorporators: John McLaren, F. B. Knowlton, Edward C. Inderlied.

NEW YORK CITY.—New York Motor Works, Inc.; capital, $70,000; to make engines. Incorporators: M. L. Rogers, S. E. Robertson, Harry W. Davis.

NEW YORK CITY.—Selden Motor Vehicle Co.; capital, $500,000; to make motors and machinery. Incorporator: W. A. Albaugh.

SYRACUSE, N. Y.—Julian Motor Co.; capital, $200,000; to make gasoline engines. Incorporator: Julian S. Brown.

VERONA, PA.—Kowalsky Motor Co.; capital, $15,000; to sell automobiles. Incorporators: J. G. Criste, W. P. Anderson, J. T. Anderson.

WARRENSVILLE, OHIO.—Brice Motor Car Co.; capital, $200,000; to make and sell automobiles. Incorporators: W. P. Kehres, Thomas J. Atkinson, John G. Schultz, E. B. Hecker, J. A. Hecker.

AUTOMOBILE GARAGES AND ACCESSORIES

AKRON, OHIO.—Electric Rubber Reclaiming Co.; capital, $200,000. Incorporators: John C. Frank, George H. Ellis, Frank E. Ream, Isaac Laubach, D. F. Felmly.

AKRON, OHIO.—Miller Rubber Co.; capital increased from $250,000 to $500,000.

CHICAGO, ILL.—Garfield Park Automobile Garage; capital, $5,000. Incorporators: H. E. Halbert, A. F. W. Seibel, Augustus Binswanger.

CHICAGO, ILL.—La Salle Auto Co.; capital, $25,000; to make accessories. Incorporators: Wm. R. Watson, Geo. W. Curtis, L. Earl Powell.

CHICAGO, ILL.—National Automobile Owners' Alliance; capital, $50,000; to deal in supplies. Incorporators: G. W. Ford, C. E. Becker, S. C. Miller.

CHICAGO, ILL.—National Spring Tire Co.; capital, $125,000; to make automobile accessories. Incorporators: Chas. L. Sigman, Jr.; Louis Valence, Chas. H. Jackson.

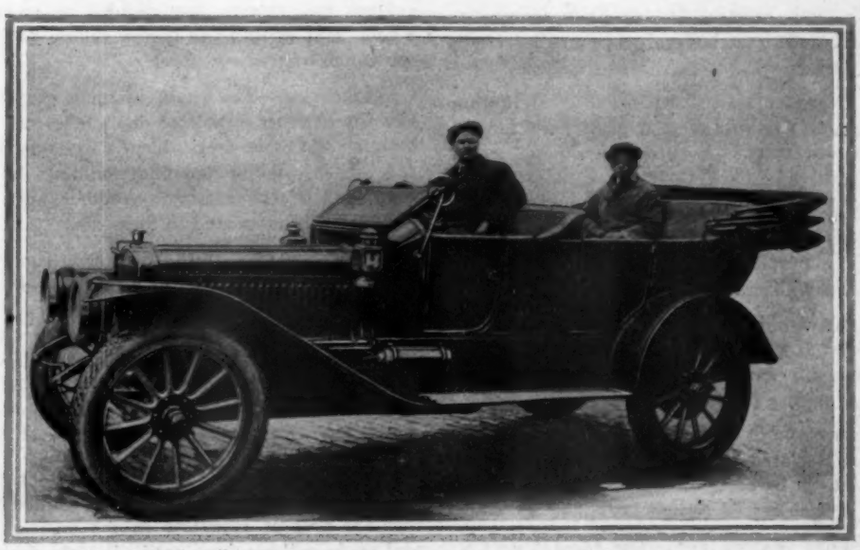
DECATUR, ILL.—North Main Street Garage; capital, $10,000. Incorporators: G. G. Council, E. R. Leggitt, Chas. T. Council.

MILWAUKEE, WIS.—Auto Starter Co.; to make automobile engine starters. Incorporators: J. D. Babcock, Oscar Fishedick, James T. Drought.

PATERSON, N. J.—Paterson Automobile Trade Association; capital, $5,000; to hold automobile shows and meetings. Incorporator: Ed. A. Browne.

RAHWAY, N. Y.—Acme Body Co.; capital, $100,000; to make automobile bodies. Incorporators: Henry A. Grube, Frank B. Gallagher, George L. Freeman.

RICHMOND, VA.—American Adjustable Wheel Co.; capital, $100,000; to make wheels. Incorporators: R. H. Bruce, Clarence Vaden, J. C. Davis.



P. W. Mulford, of Cincinnati, O., winner of first prize in Winton upkeep contest

OF INTEREST to the INDUSTRY

New factory of the K-W Ignition Company in Cleveland, Ohio.

CLEVELAND, O.—The K-W Ignition Co. has moved into its new factory at 2833 Chester avenue. The building is of steel and concrete construction and is fireproof throughout. It is 165 feet long and 75 feet wide and has over 2 acres of floor space.

RUTLAND, VT.—The Frenier Automobile Co. is constructing a large addition to its plant in this city.

BOSTON, MASS.—The G. E. & H. J. Habich Co. has been incorporated to manufacture automobiles.

HICKORY, N. C.—The International Motor Co., of this city, will erect a plant here to manufacture automobiles.

DETROIT, MICH.—The Cadillac Motor Car Co. will erect a $12,000 brick warehouse and a $10,000 boiler house on Burroughs street.

NASHVILLE, TENN.—The Hermitage Motor Co. will erect a plant here for the manufacture of automobiles and motor trucks.

ATLANTA, GA.—The Piedmont Auto Manufacturing Co. has been organized here to manufacture automobiles. The company will erect a plant.

GRAND RAPIDS, MICH.—The Michigan Suto Joint Company, of this city, expects to begin manufacturing soon at the rate of 300 to 500 joints a week.

AKRON, O.—The Goodyear Rubber Co. has declared an annual dividend of 12 per cent. on its common stock, payable January 1 to holders of record December 22.

FORT WAYNE, IND.—The Ideal Auto Co., of this city, has increased its capital stock from $50,000 to $100,000. G. H. Hall is president and F. H. Safford is secretary of the company.

FOND DU LAC, WIS.—The Dallman & Cooper Supply Company has made a large installation of welding and cutting apparatus manufactured by the Oxy-Acetylene Welding Machine Company of Kansas City.

NEW ALBANY, IND.—American Automobile Mfg. Co. is installing additional machinery for the manufacture of motor trucks. Geo. A. Buckley is superintendent of the plant. Trucks will be built in three sizes.

ANTIGO, WIS.—The International Hoist Company, which recently absorbed the Pioneer Iron Works, manufacturing gasoline engines and motors, has decided to erect a new plant in 1912 and is now selling $20,000 worth of treasury stock.

FREMONT, O.—The Lauth-Juergens Motor Car Co. has just completed plans for a new building 250 by 60 feet, which is to be used for the assembling and body-building departments of the factory. Another large building will be erected in the spring.

DETROIT, MICH.—With the end of the 1912 season still six months away the sales of the Packard Motor Car Co. already equal the entire output for the season of 1911. The increase in sales is largely due to the new six-cylinder model. Sales of Packard trucks for the year 1911 will about double the 1910 output.

DETROIT, MICH.—The market for the first week in December bears out indications that the present inactivity in the machine tool trade will continue until after the first of the year. Merchants are hopeful of renewed activity in January. The automobile and accessory plants are busy.

MERRILL, WIS.—Edward Heldt has been granted letters patent on a rotary expansive steam engine which by a suitable governing device may be made to take live steam through any portion of its revolutions, running the remainder of the revolution on expansion, and capable of having the direction of rotations easily and quickly reversed. The engine has no dead center and hence is capable of starting at any point in its revolution. As a result it has a direct, constant, and uniform torque on the driving shaft. Mr. Heldt is making plans for the manufacture of the engine at Merrill.

FINDLAY, O.—Findlay may have a new factory for the manufacture of automobile trucks if plans now before business men are carried through. The truck itself is the invention of Messrs. Ludwig Leitner and M. Weiting, two Findlay men who have been connected with the manufacture of automobiles for the past ten years. The truck invented by the two men is different in all respects from the average truck now on the market. Its chief feature is a chainless drive. It is also characterized by the location of the radiator, which is in the rear of the engine instead of in the extreme front.

INDIANAPOLIS, IND.—A new Indianapolis concern is the Bright Carbureter Co., which is to establish a factory at once. The company has been incorporated with an authorized capitalization of $25,000, which may be increased to $200,000 with the consent of two-thirds of the stockholders. Those interested in the company are: Ulric Z. Wiley, former judge of the Indiana Supreme Court; Samuel H. Brundage, of the advertising staff of *The Indianapolis News;* Clifford Arrick, broker; Henry S. Romingger, president of the Indianapolis Fancy Grocery Co., and Dr. Clark E. Day.

TORONTO, ONT.—The Schacht Motor Car Co. of Canada, Ltd., has been organized by prominent Toronto capitalists to manufacture Schacht cars for the Canadian trade. By an agreement with the United States company the Canadian company has all rights to any patents and improvements which may be obtained by the parent concern. The company has offered to the public 7 per cent. cumulative shares of preferred stock at $10 a share, each share carrying a 20 per cent. common stock bonus. In all this amounts to $15,000. Common stock to the value of $200,000 has also been offered. Orders have been received to keep the factory in full operation for several months to come.

PATENTS GONE TO ISSUE

ENGINE—Internal-combustion motor of the rotary overhead sleeve type.

4. This patent refers to an engine which comprises a cylinder and piston, as well as a casing with a port leading into the cylinder and a second port connected by a passage with the first-mentioned port. One of the ports is located in advance of the other. In the casing a valve plug is mounted revolubly and having a port located in a plane of rotation coinciding with the position of the first-named port. The purpose of this arrangement is to admit periodically an explosive mixture. The valve plug also has an exhaust port in free communication with the atmosphere and at all times totally disconnected from the first-mentioned port.

No. 1,011,601—to Albert Harris Forsythe, Joplin, Mo. Granted, December 12, 1911; filed March 29, 1910.

VALVE MECHANISM—Method of operating valves by reciprocating member between cam and valve stem.

1. The mechanism (Fig. 1) comprises a valve and stem, the valve being normally closed by a spring, but connected to a revoluble cam by a reciprocating arm. An adjustable nut is stationed immediately between valve stem and reciprocating mechanism and the nut contains a normally spring-protected member.

No. 1,011,695—to Alexander Winton, Cleveland, Ohio. Granted, December 12, 1911; filed April 29, 1911.

SAFETY APPLIANCE—Device for holding wheels in position on axle.

3. The appliance protected by this patent (Fig. 2) comprises a collar formed on an axle, wheels being mounted on either side of the collar on the axle, and each wheel having a hub. Plates are mounted on the axle and surround the collar, the collar holding the plates against longitudinal movement on the axle. Bearings on the plates support the adjacent ends of the wheel hubs, one bearing being on the inner end of the axle and one being removable, mounted upon the outer end of the axle.

No. 1,011,852—to Ernest Legrand Robertson, Greenville, S. C. Granted, December 12, 1911; filed January 9, 1911.

EXPLOSION ENGINE—Rotary sleeve valve motor of the two-stroke cycle type.

2. The engine (Fig. 3) protected by this patent combines the features of a motor cylinder connected with the crankcase as a compression chamber, and having an exhaust passage. The whole flow of incoming and outgoing gas is controlled by the position of one rotary valve.

No. 1,011,748—to Howard E. Coffin, assignor to Chalmers Motor Co., Detroit. Granted, December 12, 1911; filed April 9, 1909.

FRICTION CLUTCH—Transmission member of the cone type.

4. This clutch (Fig. 4) comprises a driving shaft and a driven one in alignment with it, as well as a casing with oppositely inclined faces carried by one of the shafts. The faces are in constant relation to one another, and a number of radially movable friction members are in engagement within the casing. A sleeve having wedge faces is keyed to the driven shaft, and means are provided for holding the friction members in engagement with the friction faces of the casing, as well as means for yieldingly holding the friction members in engagement with the friction faces. The sleeve may be actuated lengthwise of its shaft out of centrifugally actuating contact with movable friction members, whereby they are released from positive engagement with the friction surfaces of the casing.

No. 1,011,834—to Harry W. Nichoalds, Detroit, Mich. Granted, December, 1911; filed October 10, 1910.

LIQUID ATOMIZER—A specially shaped nozzle which tears up the particles of a fluid forced through it.

1. This patent refers to a nozzle consisting of a body with an exit communicating with the passage of a disk overlying the body. Over the disk is fitted a tip covering a portion of the passage mentioned and having a conical recess with a discharge port leading from same. The covered portion of the passage enters the recess tangentially.

No. 1,008,119—To Knut M. Dahl, San Francisco, Cal., assignor to Union Iron Works Co., San Francisco, Cal. Granted November 7, 1911; filed June 12, 1911.

PNEUMATIC JACK—Device for raising loads by air under pressure.

1. In this jack a cylinder containing a piston is combined with means for conducting a fluid to or from the interior of the cylinder beneath the piston, so as to cause the latter to reciprocate. The means named comprise a hinged rigid tubular handle connected to the cylinder and valved means on the handle for controlling the flow of the fluid under pressure.

No. 1,010,927—to Clarence H. Letcher, San Jose, Cal. Granted December 5, 1911; filed June 26, 1911.

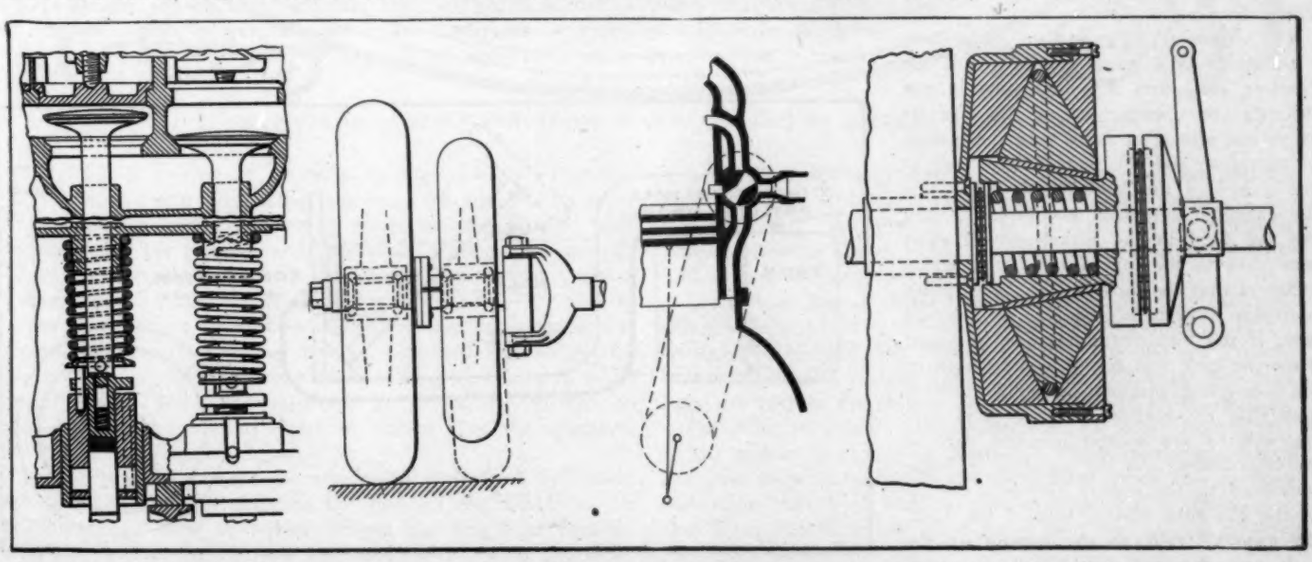


Fig. 1—Winton valve mechanism Fig. 2—Robertson safety appliance Fig. 3—Coffin explosion engine Fig. 4—Nichoalds friction clutch

Newest Ideas Among the Accessories

Vanometer Gasoline Gauge

THE Vanometer shown in Fig. 1 is a gasoline gauge of extreme simplicity of construction, as it has hardly any mechanical parts at all. It operates on an application of the principle of communicating vessels, the installation of the instrument and its connection with the gasoline tank being clearly depicted in Fig. 3.

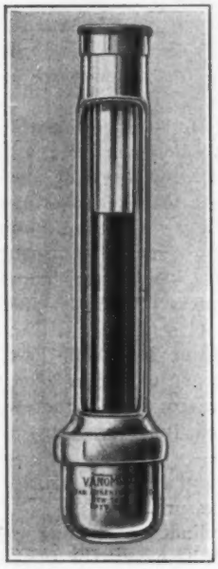


Fig. 1—Vanometer

The Vanometer consists of a U glass tube, 1-2 inch in diameter and filled with a red liquid of a certain specific gravity and chemical composition. The top of the one leg of the U tube, which is contained in a nickel casing, has an opening, so that the air above the liquid is in communication with the outer air. The other leg of the U tube is just high enough to hold the liquid when it is on the same level in both legs of the tube. This lower leg is connected to the empty gasoline tank by a gas tube after the Vanometer has been installed on the dashboard in any desirable position. In installing the gauge the level at which it is placed does not matter.

The Vanometer being in place on the dash, a 1-4-inch hole is made in the top of the gasoline tank and a coiled tube is put through the opening so as to have its lower end almost in touch with the bottom of the tank, and the pipe is connected to the branch of the Vanometer. After this the gasoline is poured in the tank, until the red fluid in the nickel-encased glass tube rises to the top of the latter, which indicates that the tank is full. This holds good for any shape and size of gasoline tank, if the Vanometer has been installed while the tank was empty. The length of the connecting member of the U tube is such that the highest gasoline level corresponds to the highest possible level in the instrument. As the gasoline is being consumed by the engine cylinders the air in the gas tube travels toward the tank, the gasoline falls to the bottom of the tank and the red liquid falls to zero, while the half-height of level in the tube corresponds to a half-filled gasoline tank, and so forth at various levels.

The Vanometer operates equally with gravity or pressure feed systems, as only the level in the tank influences that in the indicator tube. It is made by the Van Auken Indicator Co., 123 Liberty street, New York City, in sizes for automobile tanks as well as for garage storage tanks.

Single Button Switch

The button switch shown in Fig. 2 is unique in that it has but a single button for turning the lights on and off. In operation the button is first pressed in to turn on the lights, after which it immediately returns to its normal position. A second push on the button, after which it returns to the normal location, and the lights are out. The maker, Joseph F. O'Brien Co., 61 Park Place, New York, claims that the single button switch was perfect over a test of 15,000 pushes, which is more than practice requires.

The switch is easily installed, requiring only one hole to be bored in its round body.

Traver Patent Blowout Patch

This patch fits the inside of the shoe and keeps in position as long as the shoe remains in service, without being cemented or strapped, laced or bolted, as it is equipped with a sort of metal bead by means of which it locks on the rim.

The Traver patch is made of highly compressed Sea Island cotton and covered with high-grade rubber and hand-made throughout. It is moulded or cured, so that the fabric is neither crowded nor overvulcanized. Its friction surface gives it additional holding strength and it is made flexible on the sides and ends so as not to chafe the inner tube. The patch is the product of the Traver Blowout Patch Co., 1779 Broadway, New York City.

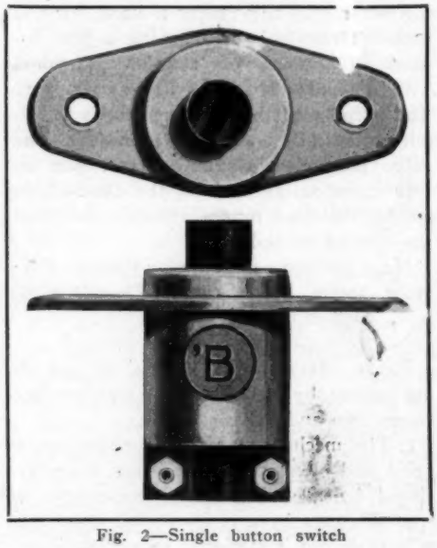


Fig. 2—Single button switch

A. A. Gas Lighter

The Auto Appliance Mfg. Co., of 18 Buchtel avenue, Akron, O., has begun to manufacture and sell a device producing a high-tension jump-spark across a gap located above the acetylene headlight burner. The system combines this igniter with the acetylene piping system, in that the flow of gas is controlled by the handle of a needle valve on the dash. One terminal of the battery is connected to the coil and the other to the piping system which thus closes the circuit as soon as the gas is turned on.

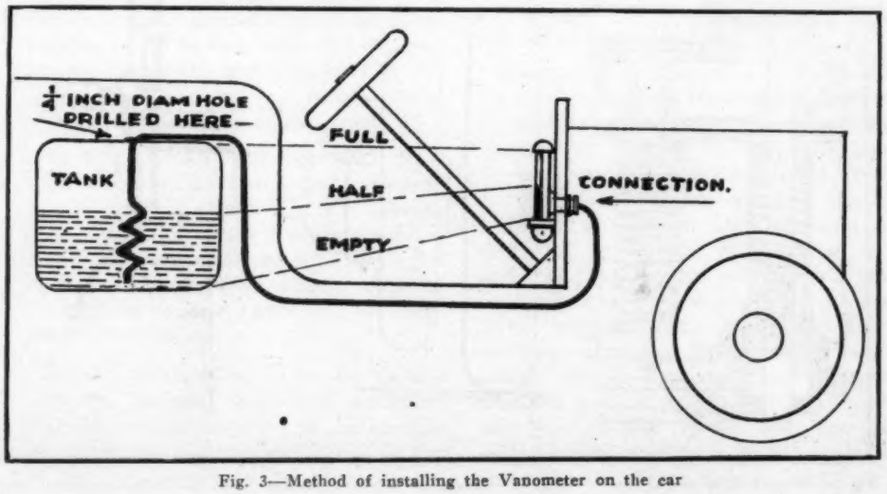


Fig. 3—Method of installing the Vanometer on the car